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DOCUMENTS SECTION

THE FARMER
AND
WILDLIFE

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THE FARMER AND WILDLIFE

By
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Published by the
WILDLIFE MANAGEMENT INSTITUTE
Investment Building
Washington 5, D. C.
1949

ACKNOWLEDGMENTS

For helpful criticism and suggestions the writer wishes to thank Edward H Graham, Verne E. Davison, and Frank C. Edminster of the U. S. Soil Conservation Service and Clarence Cottam, Arnold L. Nelson, and Gustav A. Swanson of the U. S. Fish and Wildlife Service. Many of the sketches by Oscar Warbach are used through the courtesy of the Michigan Department of Conservation. Photographs are acknowledged individually and those not credited to other sources are from the personal files of the author.

NOTE TO THE READER

This bulletin is a brief guide to farm wildlife management in eastern United States. It is not highly detailed, since it deals with a large region where condiions are variable. Also, exact information is lacking on many points. Wildlife nanagement is a relatively new subject — a young science. Its basis is land nanagement. Since that is a farmer's business, he usually has a good opporunity to make the most of wildlife values.

From the prairie edges eastward some of the principles and ideas given ere can be applied to most farms, although the deep South and extreme Northast offer their own peculiar problems. So does every farm, for that matter. And not every measure you suggest will suit its owner. We will point out some f the things the farmer *can* do, if conditions are right, and then let the result xpress his individual interests and personality.

Our approach to wildlife problems must be down-to-earth, for wild animals re, first of all, a product of the soil. They flourish or decline according to what s done with the land and its plant covering. Game and fur are an annual crop. Like the by-products of industry, they often are ignored and wasted. But the rogressive manager will give them a part in his business, however small, and dd their value to his income or his enjoyment of the place in which he lives.

Most people realize that improving the soil has its direct effect on plant life. They also understand that high soil fertility means more of such animal products s beef, milk, and eggs.

But it goes further than that. Protect and build up the soil and you enrich ll of the life that grows upon it — from earthworms in the ground to squirrels n the woodlot. How to increase wild birds and animals? The most important hing of all is to care for the land properly. In terms of centuries this means he difference between garden and desert.

Such a thought may seem inconsistent at first. All of us have seen areas o fertile and intensively used that wildlife values seem hardly worth considerng. Small truck farms sometimes fit this description. Various animals may be nore of a liability than anything else. It is fair to ask, then: If maximum ferlity means lower, even negative, wildlife values, how does soil improvement avor the management program?

The answer is that soil conservation, soil building, and a discriminating use olicy must be applied to *all* land. On our restricted, most fertile, hardest-workng acres we will not try to manage wildlife. At the opposite extreme, the poorest oils will not support a profitable agriculture; and these can be devoted entirely o such uses as forests, wildlife, and recreation.

On the vast middle ground, which constitutes the bulk of our farms, there re all types of land. Here the farmer will draw the pattern. He must select out he woodlot, wildlife, and pasture acres from among the fields that will grow orn, cotton, or tobacco. There always will be such a pattern. And the more the oil of tilled fields is improved, the better will be *all* of the farmer's crops —

those he harvests with a combine, those taken with steel trap and shotgun, a the ones he garners by just enjoying them.

This bulletin is intended to be of value to everyone interested in wildl on the farm. First of all, it should be helpful to the farmer himself. It al can be used profitably by a group of sportsmen who wish to lease the hunti rights of an area and do something about its game crop.

Here is timely information and instruction for the alert young man growi up on the farm. Probably he likes hunting. Some of his extra earnings co from pelts in the trapping season. He is curious about living things. He h agriculture teachers to help him — and time to learn and to try things. belongs to a 4-H Club and the Future Farmers of America.

This apprentice farmer will find material for his projects throughout t bulletin. The last portion "What about my farm?" was written especially to his need. It tells him how to go about things. Then, with some help from t soil conservationist or the county agent, he can apply his lesson in conservati

That is a subject his ancestors never studied. We hope he learns it well

Durward L. Allen

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Chapter I

FROM WILDERNESS TO FARMS

Many American farmers are cultivating the soil of homesteads cleared from the wilderness by their grandfathers. Their ideas about wildlife came directly from a period when that resource seemed limitless. They regarded it as a spring from which men could go on dipping at will and always return to find it full.

It was natural to take for granted that game, fur, and songbirds in abundance were something that just happened and would continue to be there regardless of what was done to the land and its cover. Consciously or unconsciously, many of us assume that the things which grow without planting are too low in value to be considered. It is only when they disappear that we fully appreciate them.

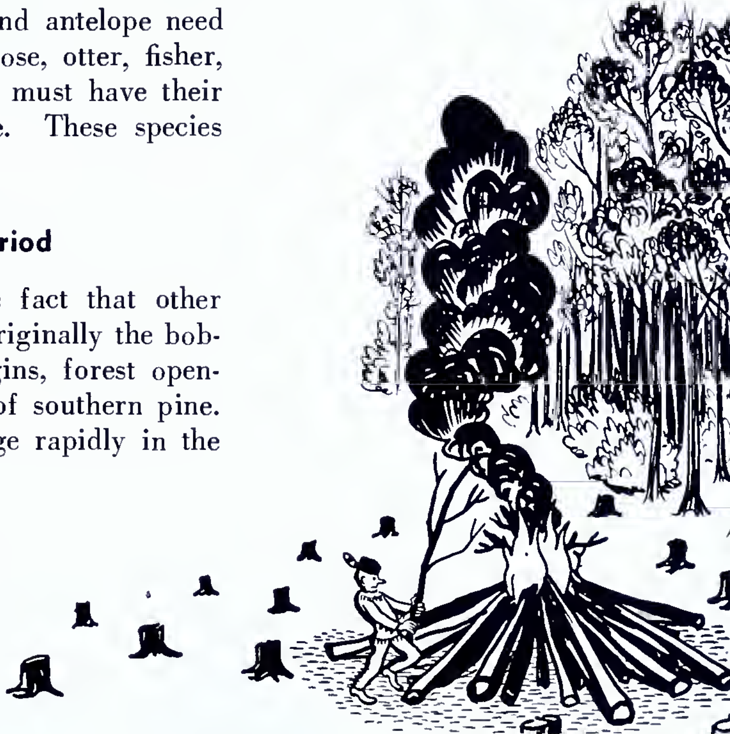
Many times we have read the story of the pioneers and how they hewed down the forest. The finest hardwood timber in the world was burned to get it out of the way. With their hand-forged implements, the homesteaders tore apart mile after mile of the prairie sod. Hardly a sample of it remains. To create agricultural values they had to destroy wilderness values. Primitive conditions disappeared over vast regions. And we are accustomed to accept that animal life was reduced of necessity and that the land had to be rendered barren of the creatures that should have peopled it.

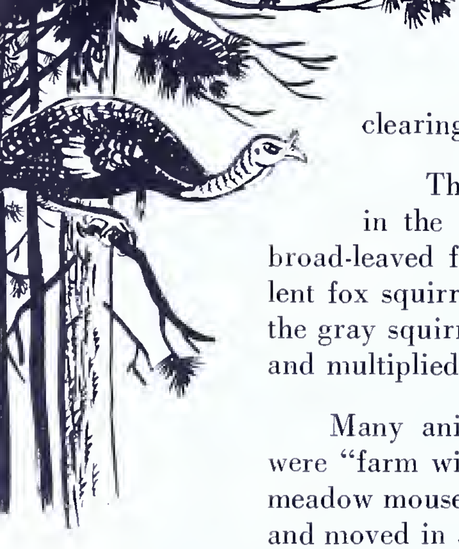
This is not the whole truth. Converting the forest and prairie to farm reduced some species, but increased others. Wild turkeys cannot live on farm- and. Gray squirrels are forest animals. Deer require extensive wild or semiwild areas, as do ruffed grouse, prairie chicken, and harp-tailed grouse. The bison and antelope need miles of range. And the elk, moose, otter, fisher, marten, beaver, bear, and bobcat must have their undisturbed living-space to thrive. These species gave way as settlement advanced.

The In-Between Period

Frequently overlooked is the fact that other nimals thrived on the change. Originally the bobwhite was a bird of prairie margins, forest open- ngs, and scattered sunny stands of southern pine. t expanded its numbers and range rapidly in the wake of the ax and plow.

The cottontail likewise was a reature of forest edges. With the pening of formerly continuous woodlands the rabbit moved into





clearings and occupied vast new territory.

The western fox squirrel was native to the woods margi in the region where midwestern prairies merged into easte broad-leaved forests. It found that the farmers were creating exc lent fox squirrel range—small woodlots mixed with cornfields—whe the gray squirrel could persist no longer. So this species, too, thriv and multiplied over a greatly extended area.

Many animals and birds less noticeable than these found th were "farm wildlife." The red fox, meadowlark, prairie mole, cro meadow mouse, and numerous others followed the changing conditio and moved in as the land was prepared for them.

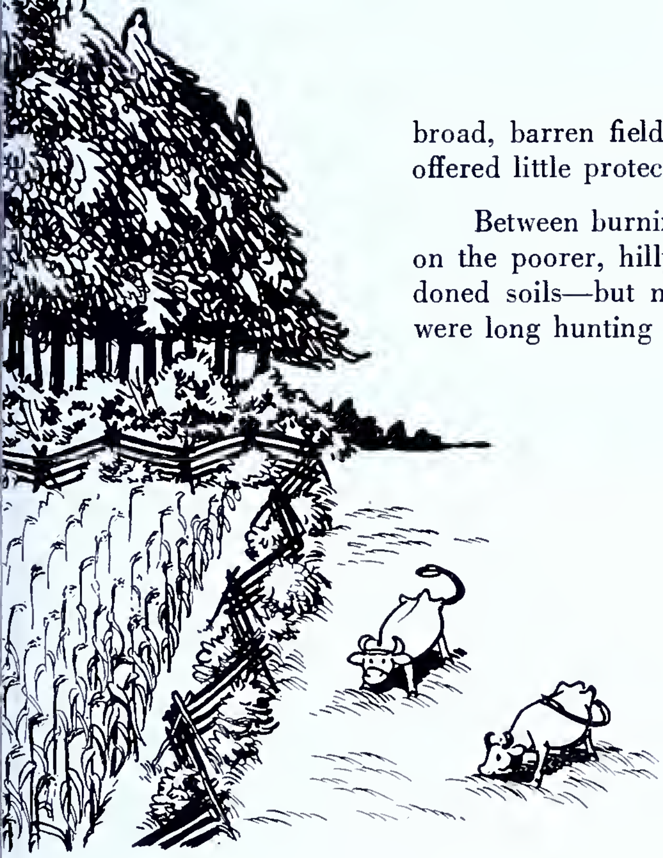
This new farm environment was created on the most fertile soils of the co tinent. In addition to the grain they raised, the early farmers introduced wi their seed from Europe a number of annual plants. Some of these, such common pigweed and the foxtail grasses, have become staple foods for see eating birds. In the farmed openings quail found abundant food and plenty brushy cover. In the North there were places where a game bag could be fill with bobwhites and ruffed grouse on the same shoot. Here the quail had ove reached itself. In Michigan and Wisconsin hard winters came, killed them o and pushed their northern limit south. But a few favorable years were all th needed. They would be plentiful again in those half-cleared, fertile opening Quail hunting became a national sport. That's the way it was — for a while.

Wildlife Cover Reduced

Then came a change. Prices went up, the human population grew, fronti disappeared, and farming became intensive. Rail fences were replaced woven wire. Farmers gave attention to accumulated brush, as clean farmi became popular. Fencerows and ditchbanks were cleared and burned regula to keep them that way. Cows were turned into the woodlot to get what picki they could until the trees were cut.

No one thought of timber as a farm crop, nor of vegetation as a protecti to the land. Farmers had few ideas about crop rotations. They knew no su terms as "green manure" and "contouring." They plowed up and down the hi if it was handy that way. And they saw the gullies, but they could not realize that their wealth, the productive topsoil, was creeping away to be swept down streams and piled into river deltas. They mined the soil of its fertility and laid it bare to the mercy of the rains.

For quail and the rest of Nature's livestock those were depression days. The thicket-hemmed openings had become



broad, barren fields, and their shorn fencerows offered little protection to wintering coveys.

Between burnings there was plenty of cover on the poorer, hilly, already eroded, and abandoned soils—but not the required food. There were long hunting seasons, too, even after game markets were outlawed, and the days of good quail shooting were gone on many a farm. By the twenties many game species had declined far below their abundance at the beginning of the century. Changes in agriculture and changes in plant cover on the land brought about changes in animal life. That has made things as they are and as they will be.

A Lesson from the Past

The last hundred years has taught us important facts about those birds and animals which inhabit the fields on which our food is grown.

To begin with, we have learned that fertile soils yield more of nearly every land product — be it wheat, rabbits, eggs, tomatoes, beef, or pheasants. And since the country's best soils are now in agriculture, it follows that these areas are potentially very high in their ability to yield game, fur, and other wildlife. This was proved during that transition period when forests were half cleared and soils were at their best. It has been proved again during the past 20

Rail fences were replaced with woven wire and clean farming became popular. How much wildlife can live on a farm like this?

All about us are ailing soils which are being misused and washed away. This means po
crops of all kinds — including wildlife.

years, as an awakened interest in wildlife management has brought about t
increase of some species in some areas.

Today, it is estimated that 80 percent of the small game and 40 percent
the fur harvested annually in this country come from farmed lands. Althou
such productivity looks high, we know that this annual crop is far below t
possibilities. In general, the nation's farm lands are in poor condition f
wildlife.

Similarly, even though farm-crop production in the United States is setti
new records, there are ailing soils all about us — soils that are being misus
and washed away. Grain, hay, and livestock yields can be increased continua
by good land management. Game, fur, and the other creatures which make t
world a brighter, better place in which to live can be encouraged and increas
by intelligent wildlife management.

As will be shown, these two kinds of management are a part of the sa
program.

Chapter II

WILDLIFE IN THE FARMER'S BUSINESS

Everything that grows on the farm — cows, oats, trees, or quail — has a proper place in its economy. The better informed a farmer is, and the better he is able to keep things in balance, the more profit he will make. An inventory of the working capital on an average farm will show what the values are and where they lie.

Budgeting the Land

Level fertile fields that support short rotations are the backbone of farm income. Grain, livestock, and other cash crops are a farmer's living. Under most conditions he would be foolish to raise timber on land that will grow high yields of corn, or to produce a poor corn crop on acres that would net a larger return in timber. Every acre should be used for its particular crop of highest value. The agriculturalist who under-uses his land is accepting less interest than his investment could yield. If he overuses it, his soil will depreciate and he will lose in the end. That is what we mean by keeping things in balance.

Where fields are on a slope or soil is light in texture, there must be longer

Level fertile fields are the backbone of the farm economy. (Soil Conservation Service Photo.)

Sloping land or poorer soil means longer rotations, more hay and pasture, and a lower pe acre income. (Soil Conservation Service Photo.)

rotations. Of course, that means lower yields, too. On hillsides, plowing ar cultivation will start the surface soils moving downward. Land of this typ must be protected by close-growing vegetation much of the time. Usually should be in pasture or long-rotation hay. If that is the most such soils ca yield without becoming "run-down," then it is the best use for them.

On many farms there are areas which must be considered "marginal" ar from which a cash return will be obtained only at long intervals. These incluc stoney, sandy, badly gullied, or steep slopes where implements cannot be use or animals grazed without erosion. However, trees can grow in such places ar they stabilize the soil. Timber and firewood are low in cash value per acre p year, but they afford a yield under proper management; and it is good busine to make the most of it.

That accounts for the bulk of the land. But there still are some leftov spots which can be devoted to increasing a crop which usually is even lower cash value than timber. The word "cash" should be emphasized; for wildlife ha a particular kind of benefit and will reward a farmer's careful consideratio en though it may not augment his income greatly. And that is what we recom- end he invest in it — his consideration and, occasionally, a little time.

The odd areas referred to often are too small and scattered to produce uch in the way of timber and fuel. The fringe of shrubs on a ditchbank, a field argin along the woodlot where soil is sapped and corn and hay are shaded dly, a rock outcrop or large gully on the back twenty, 80 rods of roadside, ncerows — this may not describe your farm, but the chances are good that e list will be similar.

Alone, the so-called "waste areas" will not produce pheasants, quail, doves, d fur animals. But by managing these areas properly a farmer can improve e over-all cover pattern on his land in such a manner as to get the most from e wildlife by-products of his crop-raising business.

Wildlife Values

Specifically, just what are the benefits to be expected from wildlife on an erage farm? We must consider these realistically, for it is easy to become thusiastic and promise too much. Under ordinary conditions it would be poor siness to devote good agricultural land to wildlife. Nor can we justify, on the erage farm, a large investment of capital or labor in this kind of management. ortunately that is not necessary if we do not expect more than we are likely get.

Fur animals represent the best possibility of getting a cash return from ildlife. The amount of such income depends upon the type of land, number of imals, prices, and the skill of the trapper.

rock outcrop that has become a small island of wildlife cover. There are 33 million acres such "waste" areas upon which wildlife will be the principal crop. (Soil Conservation Service Photo.)

Fur animals represent the best possibility of a cash return from wildlife.

In the Midwest the annual fur harvest on farms compares favorably in average value with such crops as buckwheat, rye, field peas, soybeans, alfalfa and clover seed, and various fruits. We do not ignore such produce simply because it represents a relatively small part of the total farm income.

Since the only investment in fur ordinarily is the time spent in harvesting, its selling price virtually is net income. The common farm fur animals are muskrat, mink, raccoon, skunk, opossum, and fox. In "boom" times muskrat pelts have brought as much as 5 or 6 dollars, but a 14-year average for Michigan was $1.50. Figures compiled for Michigan and Iowa show that the farm lands of each state are producing an annual crop valued at near a million dollars.

Since the per-acre fur yield of uplands is low, most farmers do not depend upon it as a regular source of income. It is not uncommon, however, for those who take an interest in trapping to earn from 100 to 200 extra dollars in a season. In the past few years exceptionally favorable prices and fur abundance in many places have made possible yearly profits of $500 or more for experienced trapper-farmers. Frequently, much of the fur harvest is taken by the rural schoolboy, who might do well to examine the possibility of managing productive spots on his farm for increased yield. Many farm potholes, marshes, and watercourses could be a source of considerably greater profit if the owner had a better knowledge of how to improve them.

Another important wildlife value is that of animals to hunt. Most farmers enjoy such fall sport. But even if they do not care for shooting personally, rural dwellers usually take pleasure in doing favors for hunting friends. Game in reasonable numbers is considered an asset on nearly any piece of land, in spite of the fact that it seldom is a source of monetary income. There are places where

Hunting targets are an important wildlife value.

Weasels and similar carnivores which pursue . . .

hunting rights can be sold, but the price per acre is low and few landowners derive anything from this source.

A well-known benefit from wild animals is that of pest control.

Many kinds of song and game birds feed upon the insect enemies of agriculture. So do shrews, moles, ground squirrels, and even larger species like the skunk and fox. Other animals live to a great extent upon weed seeds.

Less often noticed, and credited, are the predatory hawks, owls, and furbearers that pursue the meadow mouse and similar crop-destroying rodents. The meadow mouse and its relatives are the most destructive of wild animals on the average farm. How important they may be was shown by a grazing experiment in a Michigan hay meadow. Small test plots were fenced with poultry netting pens in a field where sheep were confined. Meadow mice were plentiful all through the alfalfa, and inside the pens they were protected from skunks which were actively digging them out of the sod everywhere else. At the end of the summer it was found that mice had eaten approximately three-fourths of the hay within the enclosures — more than was taken by the grazing sheep outside.

Another record from the same state showed that mice took nearly half of a corn crop left in the shock over winter. In a controlled experiment from 17 to 46 percent of the corn was destroyed in shocks left standing in various situations. Damage in shocks and granaries, or tree girdling in an orchard, usually is apparent to the owner. But he is likely to overlook the cutting by mice of standing grain or hay, and this may be the largest loss.

Destruction by insects often is similarly hidden. A study of a pastured area in northern New York showed that insects ate more grass and clover than the cattle. Indeed, the cows scarcely equalled the weight of the wild creatures of all kinds which the pastures were supporting.

No claim can be made that beneficial wildlife will control all crop destroyers. A farmer always will need to dust and spray and take special measures against particular pests. There are some noxious "bugs" that probably are controlled more by other insects than by foraging songbirds. Parasitic insects also are important factors. And a midsummer drought or a disease epidemic may wipe out the meadow mice more effectively than all predators combined.

We should neither minimize nor exaggerate the good services of wild mammals and birds in preventing crop damage. Rather they should be put in their proper perspective as *one of the agencies which prevent pests from getting any worse than they are.*

. . . crop-destroying rodents.

Human beings also enjoy the situations in which wildlife thrives.

Skunks are valuable both for their fur and as destroyers of rodents and insects.

These 20 pounds of mice were caught by hand when the shocks were removed from a Michigan cornfield. They had taken a third of the crop. (Michigan Department of Conservation.)

The greatest value of wildlife is simply the enjoyment which people, young and old, get out of having it around. (L. H. Walkinshaw.)

Any creature that gets overly abundant immediately becomes a ready source of food and is given special attention by all the animals which can utilize it. Such balances tend to keep all species at a reasonable level and thus prevent the outbreak of "plagues" of insects or rodents. When these do occur they can be appallingly destructive.

Always the wildlife value to be mentioned last is the least evident to some and the most important to many. Consider, for instance, the song sparrows that sing in the dogwoods on the ditchbank. What are they worth? How about the goldfinches that pick apart thistleheads in the hoglot? Or the cardinal that calls from a cottonwood beside the barn? Yes, even the screech owl that nests in a hollow orchard limb. Are these any part of a country homestead?

When they are gone you miss them. Many an American soldier has lain in a European ditch on a quiet day and asked himself, "Where are the birds?" You need not be a "sentimentalist" to appreciate wildlife. Most people enjoy association with the creatures that serve to make the land alive, and farmers are like anyone else. There is a high esthetic value in wild birds and animals and the situations in which they thrive. This probably contributes more to human happiness than any of the others.

Chapter III

THE NATURE OF LIVING THINGS

The more that is learned of any particular kind of animal the more it is found to be related in an infinite number of ways to the other animals and plants living about it. We cannot manage rabbits apart from everything else. The cottontail is a member of an involved community of living things. Anything that is done for one species inevitably affects another. We must consider the needs and relationships of all in order to develop a program that will emphasize the things in which we are most interested.

Another necessity is to understand those forces at work *within* a given species. The compelling tendency to expand, that is present in all populations, is not appreciated by many people. Probably farmers are better able to understand it than most. They have seen their chicken flocks, sheep herds, and dairy cows increase manyfold within a few years.

How Animals Multiply

The rabbit will serve as an excellent example of how rapidly a small breeding stock can multiply its numbers. The cottontail commonly has three, and may have four or five, litters in a season. No sooner is one brood in its nest than the female mates again. Litters averaging five may be born little more than a month apart from March to August.

It is evident that if all these young lived there would be room for nothing but rabbits in the world in short order. If none died, a spring breeding stock of 50 (half males) could be at least 500 by the fall shooting season. Something obviously must happen to many rabbits between spring and fall. According to actual experience, a 100-acre farm in good rabbit range might support a dozen breeders in the spring, and it would be reasonable to expect about 50 to be there in the fall after a favorable season.

MOTHER NATURE'S ONE YEAR PLAN
GET YOUR PRODUCTION UOTAS HERE
QUOTA FOR SKU S

Other animals also are rapid breeders. A pheasant harem of four hens and one cock has a potential increase of about 50 young. Actual increase might be 20. An average quail hen lays about 13 eggs, so that, if there were no losses, a pair would become a covey of 15 by fall. In reality, a population of 50 breeders might be 150 by the shooting season. Fifty fox squirrels in April theoretically could be about 160 in October. Although this kind of squirrel averages only four young per female per year, the species makes up for its relatively low rate of increase by taking exceptionally good care of its young. A breeding stock of 50 actually might produce a fall population of 125 animals.

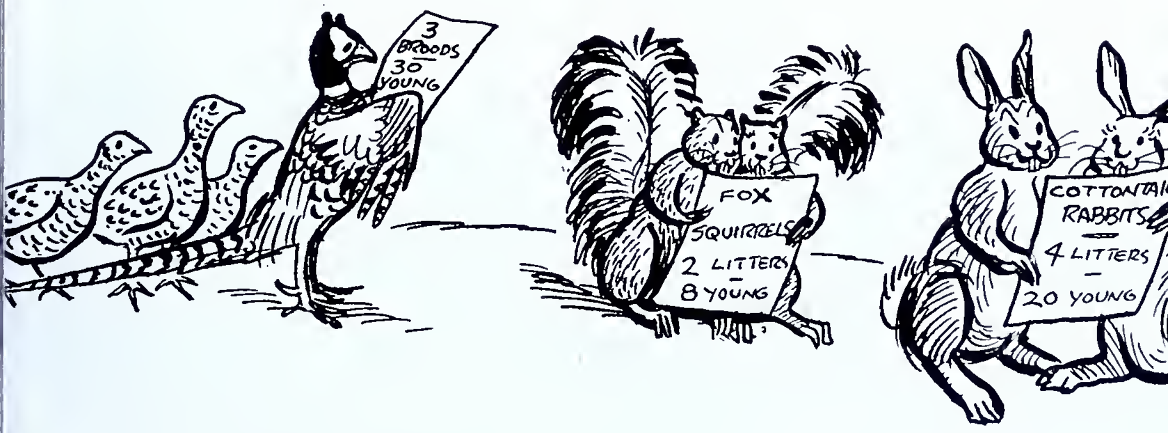
Practically all wild animals have a potentially high rate of reproduction. Try starting with a single penny, on paper, and doubling and redoubling your figures a few times. Before long the amounts will resemble a budget for the late war. That is the way animal populations increase — by *geometric* ratio.

This inherent characteristic of wildlife is very important to the management program. If conditions are favorable for the survival of young, a small number of breeders can expand in one season into a surprisingly high population. Small animals are like annual weeds, with a high yearly turnover and a short life expectancy. Occasionally we hear of a pheasant or rabbit living 4 or 5 years, but this can be very misleading. The *average* new-born young of any of our small species lives less than a year.

All of which means that we do not need to worry about raising our wildlife on game farms or trapping it in good range to be liberated in poor range. Such methods are expensive and in the end they accomplish little. Give animals favorable living conditions and they will stock themselves. The farmer does this for sheep and cattle when he improves his pastures. He can, if he wishes, do it for the wildlife crop also.

Changing Numbers

As we have seen, throughout the year the size of an animal population is changing constantly. People generally do not realize this. If, in a given fall season, a certain game animal is not so plentiful as before, hunters habitually talk of it as having been reduced or "killed off." Thinking of it in this way, they


3 BROODS 30 YOUNG
FOX SQUIRRELS 2 LITTERS 8 YOUNG
COTTONTAI RABBITS 4 LITTERS 20 YOUNG

look for some destructive factor (such as predators) upon which to blame the shortage.

Actually, it is much more likely that factors intervened during that year's growing season to prevent the customary numbers from being *produced*. Nature thins out her flocks and herds by wholesale numbers each year. But ordinarily the losses are offset by a similar large-scale production and since one quail looks like another, we do not notice the turnover of individuals.

Do you know of an area where you find only small numbers of a particular bird or animal year after year? It is likely that such an area is just poor range for that species. Probably nothing more can be expected of it until conditions are changed.

In another type of situation a land unit will produce a given species in abundance for a series of years and then production will drop off for a time. Often the numbers of animals will increase again after a few poor seasons. Such periodic declines are to be expected and they are not at all unnatural. They result from changes in factors, or a combination of factors, which may vary widely from year to year. Such variables might be weather, the acorn crop, disease, and doubtless many others that we do not know about.

The thing to remember is that animals must be expected to have ups and downs even in the most favorable kinds of range.

Wildlife Living Standards

Each species of animal and bird inhabiting our farms has life requirements somewhat different from every other kind. Yet they all have enough in common to live in the farm environment. In primitive times animals, such as the meadowlark, prairie horned lark, grasshopper sparrow, striped ground squirrel, prairie deermouse, and prairie mole, were found only in natural grasslands. Now they

are common on midwestern farms and live in pastures and hayfields. Former forest residents such as the woodpeckers, red-eyed vireo, crested flycatcher, flying squirrel, chipmunk, woodmouse, and raccoon occupy woodlots and wooded river bottoms.

But the most typical farm wildlife originally were "edge" dwellers — and they still are. Their favorite cover is the brushy intermediate stage between open field and woodlot. Their food comes from many sources but mainly from cropfields. Their nests may be in a weed patch, orchard, grassy fencerow, or alfalfa field.

The most significant thing that the farm wildlife community has, and needs more of, is variety. Large open fields will not have many rabbits or quail, nor will extensive blocks of woodland. Brushy edges where several kinds of cover come together is where life is easiest for most species. So the more we can mix the cover pattern, the greater its capacity to produce our most important farm wildlife.

Although such generalities are helpful, it will be well to examine and keep in mind some of the most significant characteristics of certain birds and mammals which have particular value as game or otherwise.

The Pheasant and Fertility

Throughout the corn belt the pheasant is our most important game bird. In fact it seldom is found away from agricultural land. A native of Asia, it was established in the United States, in worth-while numbers, during the past quarter-century. It has spread to all favorable territory in the northern, glaciated region of the eastern half of the country and also is numerous in parts of the West. Now that it has occupied practically all available range, there no longer is any need for the large-scale artificial stocking of this species.

The pheasant is a bird of fertile soils. It reaches maximum numbers on rich lowlands of the East and in cornfields of the Dakotas. The dryer climate of the western portion of this range appears to favor its hatching and survival.

Pheasants make much use of brush cover but do not strictly require it where tall weeds or standing corn offer a good substitute. Especially in the prairie states there are many completely barren farms where the addition of brush cover would improve conditions for all wildlife, including pheasants. Living fences of multiflora rose probably are the most practical means of accomplishing this (p. 74).

Pheasants are resourceful in their food habits and are resistant to northern winters. Occasionally blizzards kill them in the plains region, but this species recovers quickly from such losses. Winter feeding is unimportant in pheasant management.

To have a high population of ringnecks, what a farmer needs most is a fertile, productive piece of land. Of course, he needs that for better reasons than pheasant management. Regardless of what he starts with, he will want to manage his farm according to good soil-building practices for the improvement of grain and hay crops. And that probably is the best thing he can do for pheasants.

Building up fertility is a gradual and unspectacular process. It is unfortunate that we cannot recommend something quick and easy, both for agriculture and the pheasant. This bird has been studied with some intensity in recent years, but no effective short-time method for increasing it has been developed.

Quail Need Assistance

The bobwhite requires a somewhat different type of range than the pheasant. It tolerates humid conditions and is most plentiful in the unglaciated South. Northern winters may kill these birds over large areas, and everywhere they appear to need abundant food combined with good thicket cover in order to thrive.

Quail are especially fond of various legumes such as vetch, beggarweed, and certain lespedezas. Some of these plants have been used for increasing food supplies on extensive quail preserves in the deep South. There controlled winter burning and modified pasture and forestry practices have been developed into an efficient system of management on areas where quail are a primary, rather than a secondary, value. In our present discussion, however, we are concerned chiefly with conditions on the average farm.

Quail utilize a variety of cover and appear to favor the type of thicket

formed by the wild plum in ungrazed fencerows, or a tangle of grapevine over a fallen tree. They also make good use of brushpiles in woodlot edges and fencerows. The scattered stands of pine found in the South can be improved if food strips of bicolor lespedeza are planted on edges or in openings (pp. 78 and 81).

On farms intensively cultivated for money-making crops it is doubtful that this species ever will approximate the quail-per-acre fall populations that are reported for some southern preserve areas. As an average figure, a good population on managed preserves probably is 15 to 25 birds per hundred acres with an actual hunting yield of 5 to 10. Average fall numbers on a nonhunted 4,500-acre area in Wisconsin during a favorable period were 9 to 10 birds per hundred acres.

The farmer who manages his land favorably for quail within their natural range probably can expect densities somewhere between these levels. "Conservation farming" alone should improve conditions for this bird. Near Bernice, Louisiana, a farmer found that the two coveys which his land usually supported increased to five when he changed his methods and established a complete soil-conservation program. Along with other birds and animals, the bobwhite undoubtedly can be benefited by intelligent planning.

The Mourning Dove — A Migrant

South of Mason and Dixon's line the dove is an important game bird, and it is a familiar and popular songbird in the North.

This difference grows out of its nesting and migrating habits. Large numbers of these birds drift southward during the summer, and the remaining pairs bring off late broods in orchards and dooryards of northern farms. Hence hunting is practical only in the winter range where the birds congregate in large numbers.

Being a highly mobile migrant, the mourning dove can utilize widely separated feeding and roosting areas. For this reason a piece of ground may attract flocks even though it does not fulfill all their requirements for existence. Likewise the birds can move in and take advantage of favorable conditions wherever these develop. Sometimes the result has been that managed quail areas support more doves than quail. This species is almost exclusively vegetarian.

Plenty of good winter cover is the most important requirement of the cottontail.

They eat a great variety of seeds and grain, and food does not appear to be a serious problem.

Good dove management is largely a matter of preventing overshooting on the wintering grounds, where concentrations occur in grainfields or around waterholes. The deliberate baiting of fields for shooting purposes now is prohibited by federal law, but it is possible to make excessive kills on areas where waste grain or other food "just happened." It is this situation which the landowner can control.

Mourning doves nest in windbreaks and hedges in the prairie region and profit from the planting of fruit and other trees around homesteads.

Rabbits and the Brier Patch

The cottontail is dear to the heart of every farm boy, and for most purposes its requirements can be summed up effectively in one word — cover. Any unit of upland or lowland brush that can be added to the farm pattern will likely favor the rabbit. During cold weather in the North these animals make good use of woodchuck dens, brushpiles, and even hollow logs and trees.

Most farm lands have an abundance of good cottontail foods such as clover, dandelion, and the plantains. These are used the year around except in times of deep snow when a second-best choice is the bark and twigs of many kinds of shrubs and trees. Favorite hard-winter foods are sumac and the low-hanging twigs and trunk sprouts of apple trees.

Cottontails thrive in the presence of many enemies, when cover is plentiful, and they can be cropped heavily with the gun. The 30 million rabbits shot each year on American farms are a wildlife crop of first importance and amply worth a thought in our land-use planning.

Fox Squirrels and the Food Supply

The fox squirrel of the Midwest is typical of our farm game. It prefers small woodlands surrounded by cornfields and brushy fencerows with a plentiful sprinkling of nut trees. Hol-

A consistent food supply . . .

. . . is the vital factor in a fox squirrel's existence.

On most farms the muskrat represents the greatest cash value of any wildlife species.

low trunks are not a necessity for this animal, but they are desirable and probably help promote maximum numbers.

A consistent food supply is the most important limiting factor in the fox squirrel's existence. They need abundant summer fruits, seeds, nuts, and gree corn in order to fatten before the advent of cold weather. Acorns and other nut are stored in individual holes beneath the leaves of the woods floor or in the so of open ground.

If they go into the winter in poor condition, and an insufficient supply o mast is stored, severe weather may mean the death of many squirrels from disease and exposure. In addition, the remaining animals may not be in conditio to breed, as usual, in January and February.

The best assurance of a good food supply is the presence of a wide variet of trees, so that when one seed crop fails another will provide. Where there i ample sunlight, as in fencerows or on woodlot edges, trees develop broa crowns and bear large crops of fruit. Although, like raccoons, these animals ar quite fond of green corn, damage usually is not great enough to call down th ire of the farmer against such an otherwise popular tenant of his woodlands. I squirrels become too numerous, the hunting season is the time to deal with them

Muskrats Graze the Marshes

On many farms the muskrat population represents the greatest cash value o any kind of wildlife. This animal can live in practically any spot where there i water the year around and enough fertility to grow marsh plants.

Average muskrat yields for Michigan are 2 or 3 per acre of suitable marsh. Maryland production is much the same. These averages for large areas mean that high quality local tracts will do considerably better — possibly up to 10 or 11 pelts per acre. An Ohio investigator estimated that a good marsh should yield 15. Frequently, unpolluted streams are productive also. Watercourses bordering fertile Iowa cornfields may support 6 to 8 breeding females per mile. Offspring from each of these animals should number up to a dozen by fall.

Above all else this valuable rodent needs a constant water level and shallow-water vegetation upon which to feed. Common muskrat foods are cattail, sedges, arrowhead, and several kinds of bulrush. Transplanting a few rootstocks of these may be advisable in newly flooded areas or in sites where food plants have been killed by temporary low water.

Muskrat numbers may be reduced by floods or by the drying up of small streams and swales in July and August. Assuring a water supply during hot summer months may make an otherwise barren area productive of a fur crop. A practice particularly destructive to this animal is the grazing of stream banks and marshes. This results in the reduction of forage plants and trampled dens and tunnels. Some of the most important points in muskrat management are things *not* to do. In taking the fur harvest it pays well to use one of the improved traps with an extra spring or bar to prevent "wring-off."

Waterfowl and Marsh Birds

Among our finest game and most interesting birds are those that inhabit water areas. In the northern half of eastern United States many a farm swale or pond has its pair of blue-winged teal. Or it might be a pair of mallards or

The farm slough will be a place of interest when waterfowl are migrating.

black ducks. Coots, gallinules, pied-billed grebes, rails, and the bitterns (American and least) also are likely to be found there during the nesting season. In late summer it may be visited by one or more kinds of white herons.

In the fall such an inviting spot likely will be a stopping place for many species of waterfowl, depending upon location and the amount of open water in the vicinity. Frequently farmers who have a pond behind the barn bait it with corn or other grain and keep it as a sanctuary for migrants. Of course, it is illegal to bait an area where birds are hunted.

The needs of marsh- and pond-inhabiting birds are much like those of the muskrat. The biggest problem is to avoid fires and maintain water levels during the nesting season. Where marshes tend to close in solidly with vegetation muskrats may help to keep small waterholes open. These are useful especially to the larger birds such as ducks and coots.

Furbearers and Woodchucks

In a large measure the things already discussed as important to certain animals are the same, in different combinations, for other species. Raccoons want hollow trees and a watercourse, with oak uplands, fields of roasting ears, and thickets of wild fruits — grapes, persimmons, elderberries, plums, or whatever Nature and the farmer provide.

Woodchucks are the housing engineers for farm wildlife. Their burrows are home to rabbits, skunks, opossums, and lesser creatures. Hunting them with a small-bore rifle is excellent sport and helps to keep their numbers below the pest level.

The woodchuck likes a wide hedgerow with a stump, rock, or pile of brush under which to dig his den. Also a patch of clover for forage. If a 22-bullet flattens the woodchuck, perhaps a skunk will move in and bring forth her May litter of five. Through the summer they will dig grubs from the sod bank, glut on grasshoppers and beetles in the alfalfa field, and top it off with dogwood fruits and elderberries. In winter the den may harbor a dozen sleeping skunks, or perhaps an opossum.

YOO-HOO!
COME OUT AND PLAY.

In certain soil types the absence of good den sites may seriously limit the numbers of burrow-inhabiting animals. On an Iowa farm an increase in the fur crop was brought about by means of artificial dens improvised from old culvert pipes, drain tiles, and milk cans. Under ordinary conditions, however, the activities of this professional digger, the woodchuck, will provide sufficient dens for furbearers and other animals that require them.

Old tiles make good dens.

Chapter IV

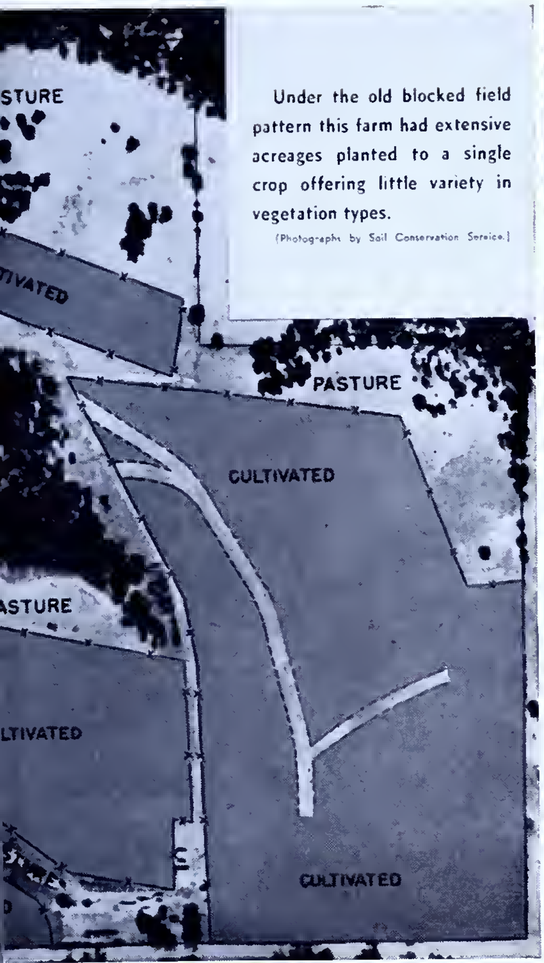
IMPROVING THE FARM FOR WILDLIFE

Creating better conditions for wildlife does not mean doing a lot of extra or "peculiar" things that will make your farm look different from your neighbor's land across the fence. A progressive farmer will carry out most of the measures recommended here because they have a dollars-and-cents relationship to crop production.

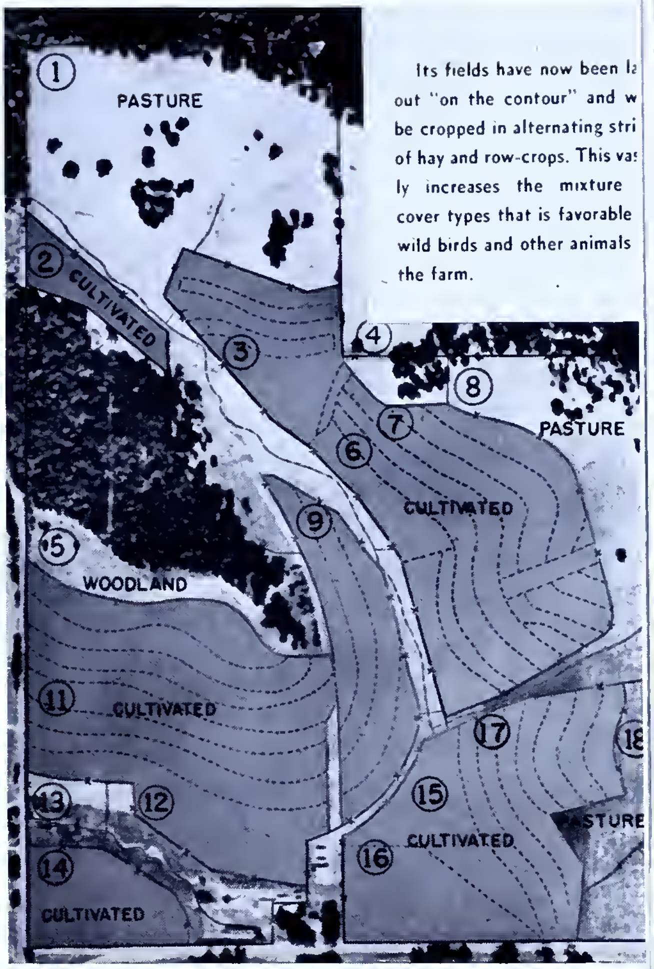
As pointed out before, most significant of all to wild species is the steady building of soil fertility that comes through planning the farm so that each portion will yield the most profitable crops to which it is suited. Over a period of years this will make shorter rotations possible and bring about increased production of grains such as corn, oats, beans, and wheat. The growing of grain increases the wildlife food supply, not only for harvest gleanings but also for the large quantities of seed produced by such annual plants as pigweed and ragweed. A farmer's best efforts at weed control will not change this materially.

In rolling land, planning a farm "on the contour" eliminates the old block

Strip-cropping is more favorable to wildlife than large blocked fields since it greatly increases the amount of "edge" between vegetation types. (Soil Conservation Service Photo.)


Under the old blocked field pattern this farm had extensive acreages planted to a single crop offering little variety in vegetation types.

(Photographs by Soil Conservation Service.)

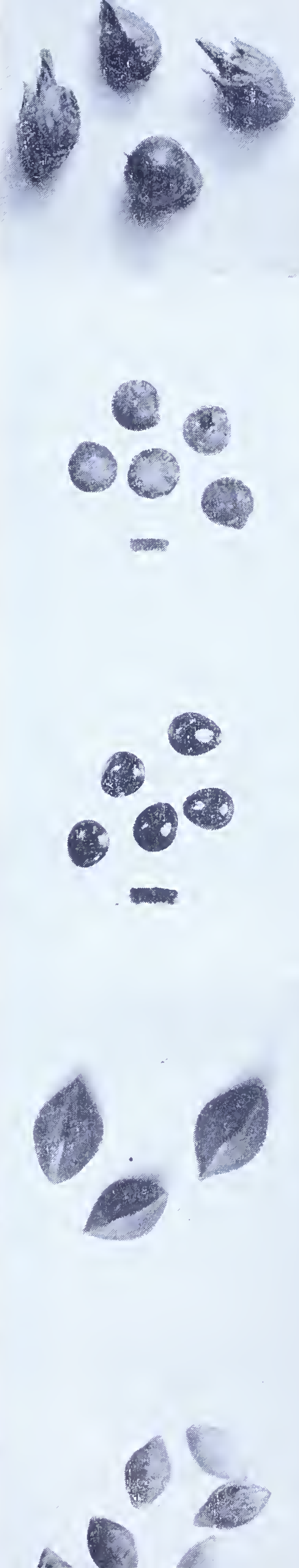

Its fields have now been la
out "on the contour" and w
be cropped in alternating stri
of hay and row-crops. This vas
ly increases the mixture
cover types that is favorable
wild birds and other animals
the farm.

pattern of fields laid out on the forty-lines. In the new plan, cropland is in narrow strips of hay or small grain alternating with row crops. Pastures commonly occur in irregular shapes to take in hilly land which should not be cultivated. Woodlots usually come in small units or narrow belts to stabilize and make productive the slopes unsuited to any other use.

All of these measures contribute to the amount of borderline which a given field will have and will produce the thorough mixture of cover types which favor most farm wildlife. Of course, on level land contouring is not necessary, but there is need for some of these practices throughout most of eastern United States.

It is on the roughest parts of the farm, the so-called "waste" areas, that we can carry out special measures for wildlife. If this is done, the pattern will be completed and the entire combination will have maximum value. Undoubtedly there is a balance between fertile fields and "problem land" that is ideal for certain species. We do not know enough about wildlife management to write such specifications in detail. For present purposes, however, that is not neces-

Fertile soils produce hundreds of pounds of weed seed per acre.



Ragweed
Lamb's quarters
Redroot
Wild buckwheat
Green foxtail

sary. What it is good business to do on a given farm will be determined, not by the ideal, but by that particular piece of soil and the lay of the land.

It will be well to consider the various cover types and surface features which might be present on a farm and discuss how the owner might handle them for the betterment of wildlife values.

Crop and Hayfields

Clean cultivated fields are places where broods of young birds can dust, sun, preen, and await the drying of vegetation on dewy mornings.

After small grain is cut in summer a thrifty growth of ragweed usually matures in the hay seeding to form a wild bird lunch counter through fall and winter. As for cornfields, every hunter knows their possibilities. The middles may have been clean when the corn was laid by in July, but by October the rows will have matured a growth of annual weeds. Some of the common kinds are ragweed, lamb's quarters (pigweed), tumbleweed, redroot, smartweed, yellow and green foxtail, barnyard grass, and panic grass. These provide abundant food for pheasants, quail and ground-feeding songbirds, and small mammals such as deermice and ground squirrels.

On low ground, cropfields frequently are bordered by ditchbanks, or their margins may be broken by patches of wet soil grown up to brush. The clear ground conditions found in such fields serve to inter-

The annual weeds found in cropfields are an important source of food for wintering birds.

rupt the solid stands of thick weeds and brush that are common in lowlands and make the entire area more habitable for many animals.

Hayfields frequently are used by pheasants as nesting places (about two thirds of the hens pick this kind of cover in Ohio), and many nests are destroyed by the mower. This is true particularly when weather permits an early cutting In many instances farmers have been urged to use flushing bars of various types to flush the hen before the cutter passes over her nest. Another recommendation sometimes made is that a small island of hay be left around any nest so discovered in order that the hen will return and complete incubation. These measures are successful in some cases, but more frequently they are not. Flushing bars are cumbersome, and their efficiency depends upon the type of mower and the speed at which it operates. Tractor mowers destroy nesting pheasants regardless of precautions taken. The small patches of hay left around nests offer dubious protection, and crows or other nest predators often find the eggs.

Protective measures for individual nests can be applied by people who are sufficiently interested, but they do not appear to be effective enough to be urged upon farmers for general use. Pheasants commonly renest after a first attempt is broken up, and they are plentiful in many places in spite of high hayfield losses Evidently they can stand a fairly heavy drain of this kind if conditions are favorable, but the increase in power mowers, and especially in the night-cutting of alfalfa for dehydrating mills, is becoming a serious handicap to pheasan production in some areas.

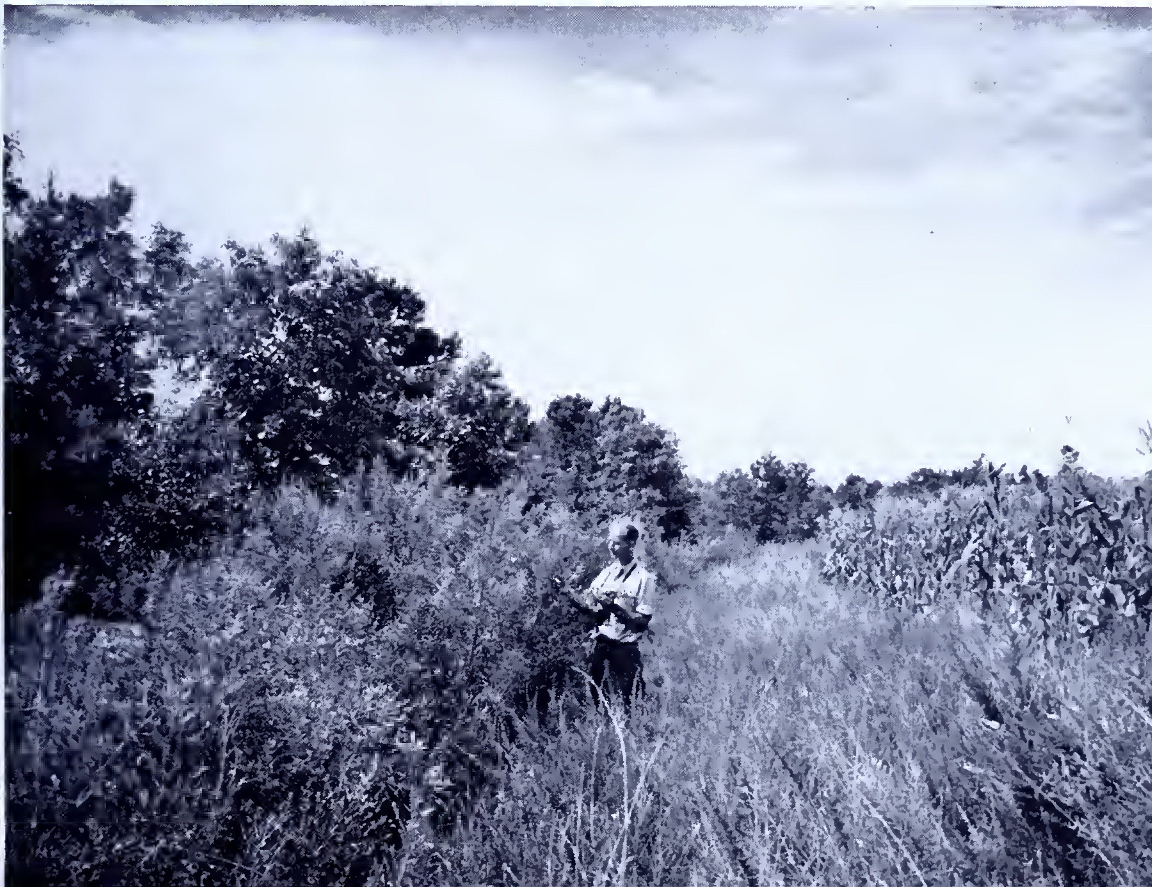
Where cropfields border woodlands there is a sapped strip that returns little in crop yields. Here the farmer wastes his fertilizer and seed. (Soil Conservation Service Photo.)

Wildlife certainly is not benefited by summer and fall plowing, although seedings at this season are necessary. In some localities clean cultivation likewise is important for the control of such pests as bollworms, strawworms, cutworms, and the hessian fly. Food for seed-eating birds and animals is reduced considerably when grainfields are disked after the harvest. The modern "stubble mulch" treatment is more favorable to wildlife, as well as having value for soil and water conservation. By this method the tilth is improved through subsurface cultivation with implements that loosen the soil but leave stubble and other trash on the surface.

Weeds on cropland produce a surprising quantity of food. Pure stands of partridge pea in Maryland were found to yield 330 pounds of clean seed to the acre. Measurements in Michigan showed that wheat stubblefields contained an average of 212 pounds per acre of weed seed on the stem in October. In this instance 97 percent of it was ragweed. Well-fertilized idle garden plots produced 457 pounds of seed per acre, of which 73 percent was pigweed (lamb's quarters and redroot).

The operation of a picker in a Michigan cornfield reduced weed seed on the stem by 75 percent, leaving 19 pounds of ragweed per acre. In Ohio mechanical picking was found to leave 3 bushels of waste corn per acre, whereas hand picking left 2 bushels. Undoubtedly the trend toward machine picking is favorable to wildlife, even though waste corn may be salvaged partially by

This field border is protected from erosion and provides cover for wildlife. Half of it is bicolor lespedeza (left) and half sericea lespedeza. The sericea can be mowed for hay and is used as a turnrow and access road. (Soil Conservation Service Photo.)



A few strands o barbed wire wil keep stock out o this old gully, preventing washing an permitting wildlif cover to grow. (Soi Conservation Servic Photo.)

cattle and hogs. Ensiling the corn is, of course, the method which leaves leas of all to be gleaned by wild creatures.

A farmer has one of his best opportunities to encourage quail and othe animals on a strip of land where cropfields border woodlands. The planting o wildlife borders on sapped and eroded field edges has been found useful especially in southeastern quail management.

Where a field lies next to the woods, a shaded strip along the border usuall yields little in the way of crops. In fact working that border, and applying fertilizer and seed to it year after year, is largely a waste of time and money. Soi conservationists surveyed 3,500 fields in the Southeast and found that for a average distance of 33 feet from woodland edges the land produced less than hal the normal crop. An average strip 12 feet wide was uncultivated.

A border of legumes planted in such a situation will have utility for th farmer and improve conditions for quail. Its main values are that it prevent erosion in the field margin and provides a space in which to turn implements a the end of crop rows. A border also serves as a roadway along the edge of th field. The thick growth of legumes prevents the spread of shrubs from the wood into the open land.

A 15-foot strip of shrub lespedeza (*Lespedeza bicolor*) makes an excellen border for woodlands (p. 81). If crop rows extend into it, the border shoul be widened by an additional 15-foot row of sericea lespedeza. Implements ca be turned on the sericea and it can be cut for hay. Bicolor makes a shrub 1 feet tall under favorable conditions.

The southern farmer who wants to make an investment in quail should plan a 400-foot strip (5 rows 3 feet apart) of bicolor lespedeza along any brushy cove or through open pine woodlands. Biologists of the Soil Conservation Servic have determined that this is about the size planting (one-eighth acre) require to support an average covey. This shrub seeds well where frost does not com before the middle of October. Within a few years new early-fruiting varieties of bush lespedeza probably will be in use.

Laying out sloping fields in narrow alternating strips of meadow and row crops is a soil-saving technique which obviously increases the amount of edge between different kinds of cover. From what is known now, this practice should be beneficial to our more important farm wildlife. An Ohio study indicated that strip-cropping benefited nesting songbirds. In block fields there were 10 pairs of birds per hundred acres of small grain as against 27 pairs in strips. Hay meadows gave similar results with 48 pairs per hundred acres on nonstripped fields and 93 pairs of birds in contour strip-cropped fields.

The question logically arises: What happens to the numbers of destructive rodents when strip-cropping is practiced? If such a land pattern favors other kinds of wildlife, it might also encourage the farmer's crop enemies. A test of this idea in Michigan indicated an opposite effect. Slightly lower populations of mice were found in strip-cropped than in block fields of both small grain and hay. The difference probably lies in the fact that such small mammals are able to fill all of their life needs within the one kind of cover — hay. They do not need the mixture of types that is so favorable to some larger birds and mammals.

In the intensively farmed lands of our midwestern prairies there is mile after mile of level blocked fields that probably never will be stripped or broken up into small units. In fact the tendency is toward larger crop units for easier handling with machinery. The great deficiency for wildlife in these grain and hayfields is cover. There is little waste land and there are relatively few places where a farmer could afford to devote much space to brush. The exceptions are fencerows and ditchbanks. Living fences of multiflora rose are well adapted to this region and can be recommended for widespread use (p. 74). Similar plantings can be used on ditchbanks to protect them from grazing and erosion.

Pastures

A heavily grazed field usually is a poor place for a bird to nest. But pastures do serve wildlife favorably under some conditions.

Where such fields extend into bottomlands or are next to extensive woodlands they help break up masses of cover and provide places for animals to move about and feed upon insects and plants peculiar to sodded areas. The seeds of trees which blow into pastures may be easier to find than those in tall-growing vegetation. Stock paths often provide good dusting places for birds, and the "crowing areas" of cock pheasants often include a portion of pasture field.

Fencing out small units of cover is one of the beneficial things that can be done for wildlife in managing pastures. Stone piles, outcrops, gullies, potholes, and pond and stream margins contribute little in the way of forage for stock but will support wildlife cover if they are not grazed or burned. A few strands of barbed wire or some salvage woven-wire fence is enough to protect such places. Planting a fence of multiflora rose around them is better still. Using a living fence around the pasture itself probably is the best single measure that can be used for wildlife in grazing land.

Woodland will stabilize the steep slopes on a farm and yield a crop of timber, fur, an game.

A shrub border helps to close up the woodlot against the drying action of winds. This is beneficial to both timber and wildlife. (Soil Conservation Service Photo.)

Woodlands

Managing farm woodlands offer some of the best ways in which a land owner can encourage various kinds o birds and mammals.

In rolling land there usually ar numerous scattered spots which can b devoted profitably to trees and timbe In five midwestern states 18 percent o the land is in woody vegetation an so-called "waste" areas. Steep hillside obviously are well suited to woodland as are areas that have been eroded severely in the past. River and strear margins should be given the protectio of forest growth not only to preven

Formerly grazed, this woodlot is on its way to recovery. The border planting is spruce and pine. Such conifers can be planted within the woods, since they grow well in partial shade. (Soil Conservation Service Photo.)

A grazed woodlot is neither a good woodlot nor a good pasture. The farmer will profit by making it one or the other.

gully formation but to slow the rush of flood waters and prevent bank cutting.

In many places around the farm a few trees can be allowed to grow for pasture shade and to provide nut crops for squirrels and other wildlife. Small groups of trees usually yield poor-quality sawlogs, but even a fraction of an acre can produce fence posts. A farmer in Tennessee planted a gullied slope to black locust and only 6 years later cut the posts for a new fence.

Large stands of trees can be managed permanently for timber, firewood, and other wood products which are useful on the farm or in demand in local markets. Woodlots should serve as continuous cover on locations that are "marginal" for agriculture. Hence, they must be allowed to grow, reproduce, and replace trees that are removed. It defeats a farmer's land-planning purpose to graze his woodlands. The woods is not a good pasture, and a pasture is not a good woodlot. That slope on the back forty should be either one or the other, but not both.

To be in condition for sustained yields of woody products, a stand of trees should represent all ages and a variety of species. It should have a thrifty undergrowth of shrubs and seedlings. The floor of a healthy woodlot is a thick porous mat of leaves and duff. This soil cover is of great importance, since it permits the free absorption of water and practically eliminates runoff. It also provides a favorable medium for the sprouting of seeds and a place to live for shrews and other small mammals which destroy large numbers of insect enemies of the forest.

To maintain this ground condition the edge of the woodlot must be closed with thick shrubs to cut down the drying action of the winds. These usually wil develop naturally if the stand is protected from grazing and burning. If not, or if the farmer wishes to speed up the process and create best-possible conditions he can install a planted border on the woods margin. This will do the most good of course, on the side next to the prevailing winds.

A woodland border usually consists of two to four rows of shrubs with the tallest species next to the trees and the lower forms on the field side. This gives a sloping surface which will help to shunt the winds up over the trees. Accord ing to locality and situation the shrubs described on pages 78 and 79 are usefu in planting such borders.

Although a shrub border will "finish off" a woods for both forestry and wildlife purposes, the mere exclusion of grazing usually allows a filling-in o undergrowth that will give adequate protection to the stand. This is all that mos farmers will wish to do. But this alone would bring about a great improvemen in many rapidly deteriorating farm forests.

To determine exactly how these changes occur, an Ohio biologist studied two maple woodlots separated only by a fence. Both had been grazed heavily in times past, but 10 years previously one farmer had erected a barbed-wire fenc to keep out the cattle. In 1941, after a decade without grazing, this grove had an average of 53,000 young trees from 6 inches to 21 feet in height per acre Across the fence, where grazing continued, there were less than 1,000 seedling

A woodlot should be an all-aged stand, with a thrifty understory of shrubs and youn

The preservation of hollow trees encourages squirrels, raccoons, and nesting birds. It is one of the easiest measures of all.

per acre—all less than 5 inches height. The healthy woodlot had loose, porous soil which covered tre roots and did not freeze in winter b neath the even blanket of snow whic it collected. In the grazed woods tre roots protruded from the hard-packe ground which was frozen to a depth 2 to 6 inches and largely blown cle of leaves and snow. A spring censu for four seasons showed that 19 speci of nesting songbirds used the protecte woods with a yearly average of 1 pairs per acre. The grazed woodl harbored only eight species and 0 pairs per acre.

As mentioned before, the large seed crops are borne by trees in th open or on woodlot edges where ther is abundant sunlight. Therefore, th more woodland is scattered in sma units and irregular shapes, the mor edge there will be and the greater th resulting food supply for squirrels an other mast-eating animals. Where th land surface is irregular, the application of a modern land-use plan commonly brings about these favorable conditions.

In his woodlot cutting practices a farmer has a good opportunity to increase cover for rabbits and other ground animals. In most areas foresters recommend that timber be harvested by selecting out certain kinds and classes of trees as they become marketable. Occasionally it also is advisable to take out inferior trees or to thin even-aged stands in improvement cuttings. Quite often only a slight modification of ordinary methods can mean much better wildlife management.

Trees growing in the open develop larg tops and bear large crops of nut Squirrels have been digging up acorn under this oak.

Fencerows offer some of our best opportunities to create favorable conditions for wildlife.

For example, it has been a common practice in the past to burn the slash which results from woodlot operations. It is good business to allow cuttings to rot down and enrich the soil. Better yet, they can be piled over the nearest stump to form year-round cover for rabbits, quail, pheasants, and other animals. Woodchucks frequently dig their burrows under brushpiles, with the result that rabbits find an underground haven in a strategic location during the winter months when they need it most.

Within woodlots the preservation of hollow stubs is good management for squirrels, raccoons, and various birds. Where a hollow tree is large-topped and shades young growth, it can be girdled and allowed to stand. It will be a wildlife "apartment house" for many years before it finally rots away and returns to the soil.

When a farmer wishes to reforest a rough area quickly, the planting of pines or other conifers often is practicable. Some species, such as Scotch pine, are salable as Christmas trees, thus yielding a return at the first thinning. "Evergreens" are popular with farmers for the improvement they make in the appearance of the land within a few years. They offer excellent cover to many birds and animals and are especially valuable if planted near cropfields which will be a source of winter food. Pines frequently are used to good advantage for interplanting poorly stocked woodlots.

Fencerows, Ditchbanks, and Roadsides

The most significant difference for wildlife between any two farms may be the condition of their fencerows. Nearly everyone knows that brushy fence lines

Living fences of multiflora rose are an important new development for agriculture and an ideal way to put wildlife cover between cropfields.

provide good wildlife cover, but many people do not realize that it is good agricultural practice, under most conditions, to keep them that way.

Not so many years ago clean farming was advocated and practiced so widely that the bare landscape which is produced became a matter of pride with many rural landowners. The idea still is prevalent, but the soil conservation movement is spreading a new idea with regard to shrubs in fencerows. Recent work shows that they have something worth-while to offer the farmer who is willing to learn and make changes.

A fencerow of brush and sod acts as a filter strip and prevents or slows the flow of water from one field to another. This aids in controlling erosion and contributes to the absorption of water by the soil. In England and parts of Europe, where field boundaries have been stabilized by shrubs and vines for centuries, it is common to see a field on one side of the hedgerow several feet below the one next higher on the slope. The hedgerow itself forms a ridge that

vegetation is no longer considered a liability to agriculture. (Soil Conservation Service Photos.)

is a tangle of soil-binding roots. The soil in each individual field has sought level so slowly that no gullies formed and fertility is not impaired.

A strip of shrubs and small trees between fields also has a beneficial wir break effect. It helps to prevent wind erosion when the ground surface is l bare in winter. It also reduces the drying action of air currents and thus cu down the evaporation of soil water in dry weather.

Formerly it was assumed that brushy fence lines might harbor crop pes More recently we have learned that they are much more likely to serve as cov for birds, predaceous and parasitic insects, and insect-eating small mammals. Ohio biologist whose work was mentioned before showed that there were times as many songbirds in brushy fencerows as in open cropfields. Such fie borders also contained 60 times as many aphid-destroying lady beetles as sodd fence lines.

In addition to songbirds, a strip of brush between fields is attractive skunks, weasels, and birds of prey which feed upon the meadow mice in hay a grain fields. The small animals that live in shrubby fencerows are for the m part either beneficial, like the shrews, or of kinds like the woodmouse which not commonly destroy crops. Sodded field borders are likely to harbor hea populations of destructive meadow mice, which spread into cropfields. The animals do not live in thick brush.

In the study referred to above it was found that 2 miles of "clean" fen row add up to an acre of wasted land. By allowing brush to grow on it this la can be used to improve conditions both for agriculture and wildlife.

Maintaining fencerows may involve some labor, depending upon the kin of shrubs and trees present. As wild cherries and other tall-growing species rea the proper size they can be cut and buzzed up into firewood. Such thinning w encourage low-growing brush. In some areas it will result in stands of blac berries and other wild fruits suitable for household use. Exceptionally good n trees can be left in fencerows where they will receive ample sunlight and be heavy crops.

Woody vegetation protects ditchbanks from erosion and helps wildlife in lowlands. (Illin Natural History Survey Photos.)

There are places where burning is a valuable wildlife management tool. But on farms this is seldom true. It destroys humus that is needed in the soil, ruins fences and woodlots, and eliminates the nesting cover of many species of birds and animals.

Fences between fields that are pastured as a part of the rotation will be kept clear of woody plants by stock grazing. However, in such situations a type of fence can be used which is good cover in itself. We have mentioned it before.

In the 1850's, before the advent of barbed wire, Osage-orange came into general use for living fences in the midwestern prairies where there was no timber to split into rails. These fences were excellent cover for many kinds of wildlife. But Osage-orange (hedge apple) grows into a fairly large tree if it is not cut back each year. The annual maintenance job made this particular living fence unpopular when wire appeared on the market to take its place.

Now, however, a shrub has been introduced that makes an even better fence than the Osage and it does not require expensive maintenance. The technique of fencing with multiflora rose is one of the outstanding contributions made by soil conservation biologists.

Adapted to a wide range of soil conditions, seedlings of this Asiatic rose planted a foot apart will in 3 to 5 years form a thorny tangle that is impenetrable to livestock. It requires no pruning, makes excellent ground cover, and is used by nesting birds. Farmers who have pastures surrounded by multiflora fences take more pride in them than their fathers ever did in brushless farms. And well they may, for this densely flowered shrub is a thing of unquestioned beauty as well as utility. Its use to prevent trespass is discussed on page 72.

In hilly areas a farmer's best fields frequently are on the lower portions of his land. It is this soil that he will be concerned most about using intensively. He will cultivate close to his dividing fences and there will be a minimum of space left for woody plants.

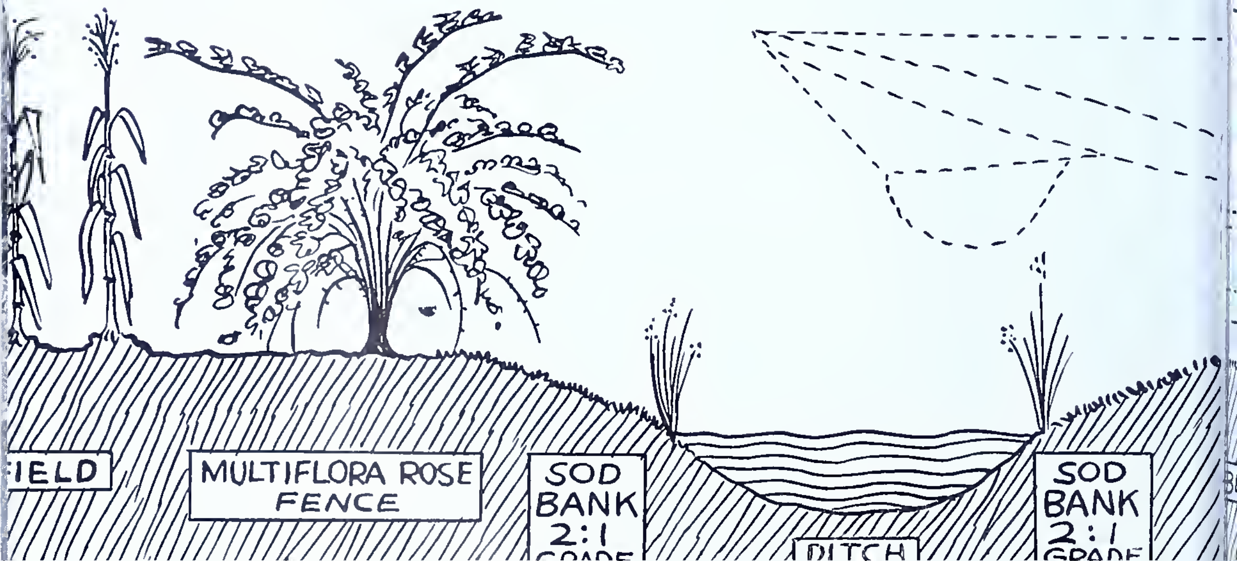
In such situations, however, there usually are ditchbanks which can best be stabilized by leaving them in a thick growth of brush and natural grasses. This will prevent gullies from cutting into the bank and the ditch from filling up with sediment. Shrub-bordered drainage ditches and brushy swales often make fencerow cover of least importance on low land, but woody plants grow so rapidly on moist fertile soils that they will be present wherever the land is not broken up or grazed.

Where drains require periodic cleaning, provision must be made for this in planning bank vegetation. It is particularly important that banks be protected from grazing, and fences usually are necessary. The strip of level ground inside the fence on one side may be allowed to grow up to shrubs, or it can be planted to willows, silky cornel, and similar low-ground species. The sodded ditchbank usually slopes down from the shrubs at about a two-to-one grade to the water. Across the ditch the other bank will slope up to a level berm which also should be maintained in grasses or legumes adapted to local conditions. This berm will need to be about 12 feet wide to allow space for a dredge to operate. Beyond this is the spoilbank, which should be stabilized by sowing it to sweet clover, alfalfa, sericea, or bicolor lespedeza. In this condition it will be a source of muskrat food and an excellent place for ground-nesting birds. The spoilbank can be bordered by another fence if the adjacent field is pastured.

How a farmer handles his ditches will depend upon local conditions, but the above pattern is a good one for wildlife and it is practicable in many situations. Instead of wire, multiflora rose can be used for the fences.

The burning of ditchbanks and fencerows is poor business. It destroys the zinc coating of galvanized wire and permits rust to ruin the fence. Wooden posts also are damaged, not to mention the nests of birds and rabbits which are burned over when fire is used in spring and summer. Under some conditions burning increases the proportion of objectionable weeds.

Roadsides represent one of the best opportunities for cover management on the farm. The usual practice by county road commissions is to make a clean



sweep of road right-of-ways, cutting everything out as often as money and labor are available. Between times brush grows back rapidly and in a couple of years may be impeding traffic.

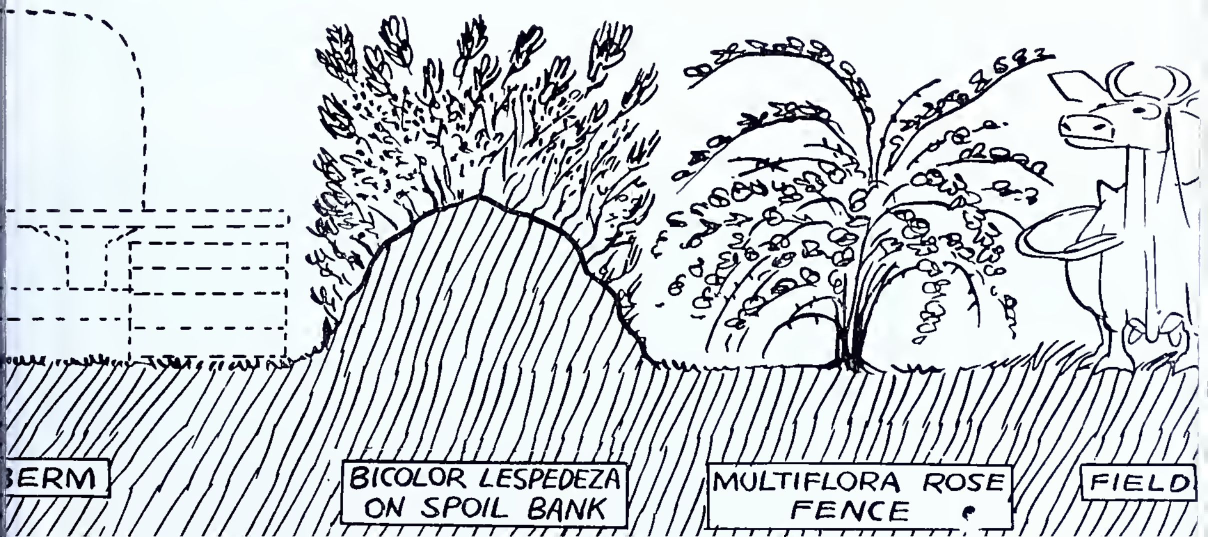
Roadside brush can be a liability in several ways. It obscures visibility at corners, and on narrow poorly maintained thoroughfares may brush passing cars. In winter, clumps of brush may cause snowdrifts to be deposited in traffic lanes.

Where a good job of roadside maintenance is not done by a public agency, a farmer may wish to make arrangements for doing this himself. If the road shoulder is reasonably level, so as to permit access with a mower, the maintenance cost should not be large once the necessary initial cutting is done.

Slash from roadside trimming sometimes may be piled across the fence and left unburned in spots where it will not be in the way. From the standpoint of both appearance and wildlife needs, the road right-of-way should be neither completely cleared nor allowed to close in entirely to brush. Narrow thickets and clumps of shrubs might be left next to the fence and the rest of the space kept in sod by summer mowing. Corners and snow-traps should be kept clear. Where slopes are steep a mechanical mower may not be usable and hand work will be necessary.

Whether or not such a roadside program is practical depends upon the circumstances. But such a method has good possibilities for keeping permanent cover on the land, and it will make the right-of-way more scenic. Some of the more progressive state highway departments now are planting conifers and other trees and shrubs in irregular clumps to achieve a pleasing type of rural landscaping. An individual farmer could get the same results simply by leaving many of the attractive native shrubs which grow naturally along his roadsides.

From Maryland southward highway cuts and road shoulders can be protected from erosion with kudzu. This plant is a rapid-growing, leguminous vine that roots at the nodes and forms a protective mat over the soil. It is ideally suited to unfavorable sites and is a good builder of fertility. Kudzu may vine over fences, but it is such a palatable pasture plant that a little grazing will hold it in check.



Formerly an unsightly erosion scar, this is now a "wildlife area." (Soil Conservation Service Photo.)

Hedges and Windbreaks

Planted hedges frequently are an important part of soil conservation plans for large strip-cropped areas. Hedges make good permanent field boundaries and serve as guides to contour cultivation.

Most frequently used are thick-growing shrubs, such as multiflora rose, bayberry, Tatarian honeysuckle, coralberry, or various viburnums which help to

Planted walnuts and hickory nuts need to be protected

reduce soil washing and increase absorption of water. They are planted between contour strips, on diversion terraces, and along contour fence lines.

Hedges and windbreaks have the same values that have been discussed for brushy fencerows. They serve an important function in reducing wind erosion and evaporation in fields of growing crops. They form wildlife cover in what otherwise would be large open areas. Particularly on prairie lands from Illinois westward windbreaks and shelterbelts often are the best cover on the farm for pheasants, quail, rabbits, and other species. Experimental work now is being done in the Southeast on the use of bicolor lespedeza in contour hedges for quail management. This gives promise of being another effective way to use this shrub, which is being employed widely in field borders and food strips.

Gullies, Dumps, Gravel Pits, and Odd Corners

Frequently in setting up a system of contour farming there will be small correction strips and "left-over" areas such as deeply gullied hillsides that are too small for a woodlot and not suitable for agriculture. Such spots should be

from squirrels. Set the nuts under a tin can and cut the bottom open.

The farmer who owns this marsh derives 25 percent of his income from pelts. Muskrats also help to keep marshes open, thus maintaining their value for waterfowl. (Soil Conservation Service Photo.)

allowed to grow up to native brush and will help to round out the cover pattern for wildlife. Any undisturbed land in the eastern, originally forested, portion of the country will be taken over by a natural succession of shrubs that ultimately will give way to trees. If he wishes, a farmer can cut the trees when they reach firewood size and allow the smaller brush to take over again.

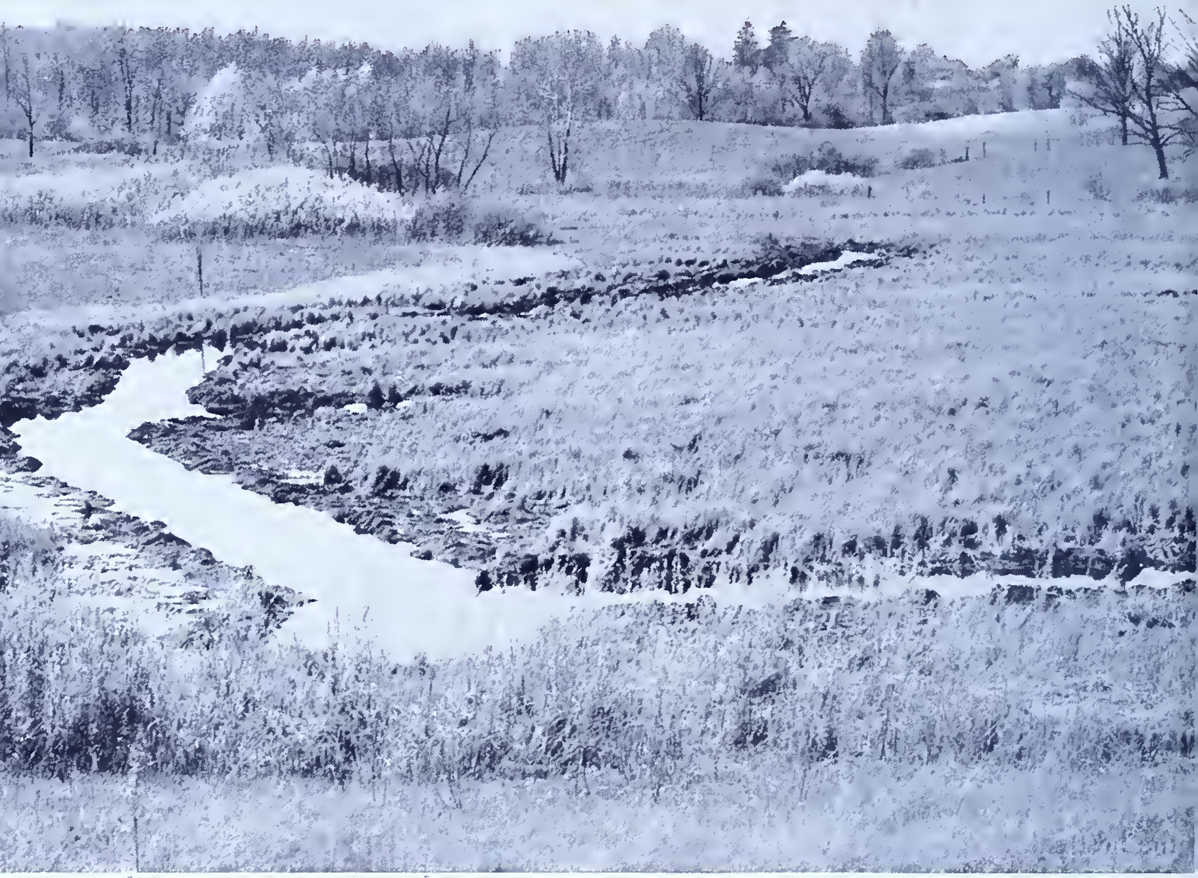
Where it is necessary to pull out an old fencerow, the resulting brush can be piled over the pulled stumps around a gully. It should not be piled *in* the gully, as this will shade out soil-binding grasses, but brushpiles aid erosion control if they are placed around the head of the wash. Songbirds perch on the brush and their droppings fall onto the mineral soil on the exposed stumps. The seeds of many shrubs, such as raspberry, blackberry, Virginia creeper, elderberry, and nightshade, pass through the digestive tracts of birds and are sown in this manner in and around the heaps of cuttings. As it rots down each brushpile will form the nucleus of a thicket which will spread outward and help to stabilize the soil. Making a few brushpiles along lanes, in fence corners, and other out-of-the-way places is one of the most effective ways of getting native woody vegetation started where more wildlife cover is needed.

Old worked-out gravel pits, dumps, building foundations, or any other spots which do not fit the farming pattern can be made more attractive by devoting them to brush cover and thus contribute to the wildlife crop. Cut brush can be piled on an old timber, a rock, stump, or fallen tree, which will make it useful for a longer period than otherwise. Surrounding such an area with a living fence of multiflora rose makes an ideal covert.

Odd corners of the farm sometimes include a portion of an old orchard with its decrepit apple trees. Felling one of these trees and planting wild grapes beneath the spreading top will result in a "living brushpile" which cannot be excelled as cover for the bobwhite and many other species. Such a tangle increases in size year by year and needs no maintenance. The planting of pines, spruces, and other "evergreens" in odd corners is a method of making the farm more attractive and providing ground cover in only a few years.

Locations such as those being discussed also are ideal places for nut-bearing trees such as walnuts. Walnuts can be planted under an inverted tin can which is pressed down into the soil. A cross is cut into the bottom of the can and the points bent up to allow the sprout to push through. This will protect the planted nuts from foraging squirrels which are likely to get a high percentage of them otherwise. Scattering walnut and hickory trees over his land is one of the best squirrel management measures that can be used by the average farmer.

Water areas are productive of wildlife and help to make the farm a more attractive place to live. (Soil Conservation Service Photo.)



This marsh had become a solid stand of vegetation. Blasting out a ditch with dynamite has improved it for muskrats.

Marshes, Streams, and Ponds

Why have standing water on a farm? There are several reasons. Not every drained marsh will make an onion patch or a mint field. The soil may not be right or drainage may be too expensive. Besides, these areas have value as they are—or as they can be if some improvements are made.

A good and fundamental reason for holding surface water on the land is to let some of it trickle down through soil and rock to replenish the "ground water." This flows out in springs and helps to keep streams from going dry. It also is what we pump out of our wells and what keeps plants alive during drought periods.

But there are more direct reasons. Mink, muskrat, and raccoon pelts from the wet areas of a farm sometimes provide an income comparable to the yield of good upland soils. Since the muskrat is our most important furbearer, the management of water areas might well be directed toward making conditions favorable for this species in particular.

Using the Muskrat

As any farm boy knows, marsh-dwelling muskrats live in houses made of rooted-up plants like the cattail and bulrush. The digging necessary for its construction often leaves the lodge surrounded by a small area of open water, and such evidence of fresh work indicates which houses in a marsh are harboring rats. Allowing five or six animals for each occupied structure will give a fair estimate of the total fall population. It is reasonable to take a crop of from two-thirds to three-fourths of the muskrats; that is, such a harvest can be expected if trapping weather is favorable and the trapper knows his business.

Streambank muskrat populations can be estimated on about the same basis. By studying signs the trapper can get a fair idea of the number of occupied bank burrows. For practical purposes you can anticipate about the same number of rats for a system of tunnels as for an active lodge in the marsh.

Wherever possible, a prudent trapper will stake his traps in deep water so that the animal drowns as soon as it is caught. The use of "stop-loss" or similar traps also will help to prevent waste in trapping.

Good and Bad Drainage

Extensive drainage operations have done much to reduce the numbers of marsh and swamp inhabiting wildlife. Of course, drainage frequently pays well in high crop yields. And sometimes, too, it benefits upland wildlife. Some of Ohio's best pheasant range is in Wood County, which lies in the midst of the "Black Swamp." This region was made suitable for a highly profitable agriculture by 2,350 miles of public drain.

Numerous other projects have not turned out so happily. Too often drains have been installed without sufficient study and with entire disregard of wildlife values. In two areas alone, the Florida Everglades and northern Minnesota, more than 6 million acres were drained and then abandoned for farming.

The famed Horicon Marsh of Wisconsin, once one of the finest wildfowl areas of the Midwest, was drained at great expense. The project failed as an agricultural venture. Now its 40,000 acres are by further expenditures being re-flooded and returned to wildlife production. We soon will be able to tell the same story of the Kankakee marshes of Indiana and Illinois.

These are large areas where waste is easy to see. But the farmer has similar decisions to make on his small streams and waterholes—and he need not guess. Whether or not wet land is suitable for farm crops can be determined by a specialist who deals in these matters. Such services are available in every soil conservation district, or information can be obtained through the Extension Service. The most important point to remember is that standing water is not always a liability. In recent years floods, dry wells, disappearing lakes, and dust storms have demonstrated the results of overdrainage, agricultural misuse, and the necessity for keeping water on the land.

In consequence of some of our costly lessons, a more realistic view of drainage is gaining ground. Thousands of dikes and dams are being built for flood control, stock water, and fish ponds. In dry uplands water is not allowed o rush away. It is trapped by terraces and other means and held to soak into he soil. High fur prices have encouraged an interest in the minks and muskrats hat a stream bottom or a patch of swale can produce. And that other less concrete value — esthetics — is to be considered especially in the case of lakes, treams, and marshes. They add beauty, variety, and possibilities for recreation.

Even a half-acre pothole with its fringe of dogwoods, elder, buttonbush, and cattails is an ornament to any rural landscape. The farmer may pay little attention to it. But his wife or his boy may watch for the coming of the redwings. They may wonder about that tootling call that is the sora rail or stop to listen on a summer evening to the thunder-pumping of a bittern.

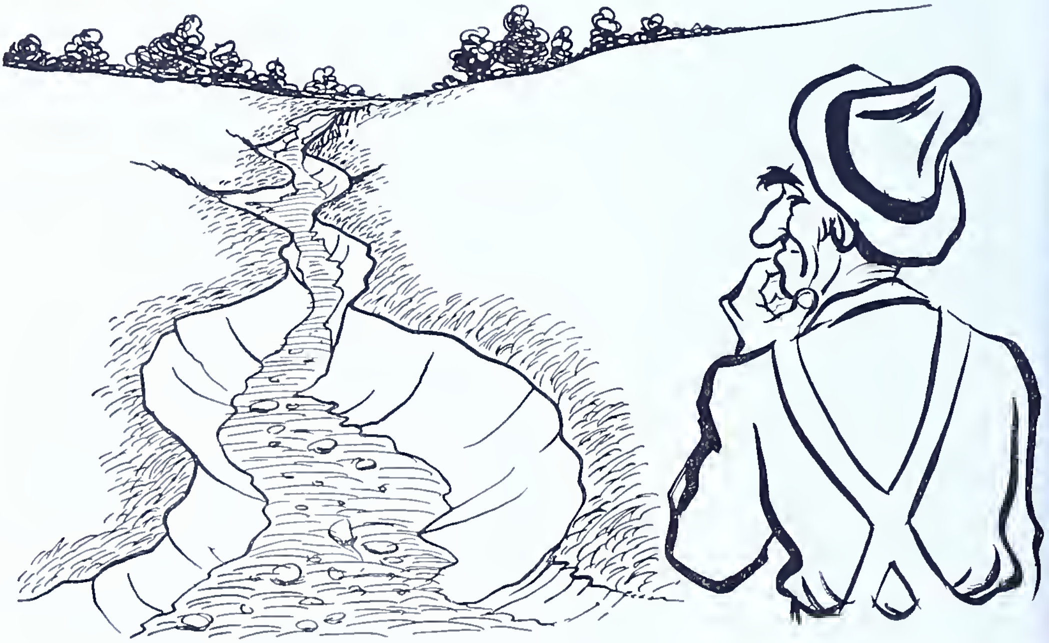
Yes, we need some water on the farm.

Managing Wet Areas

Our most important furbearer, the muskrat, depends primarily upon stable water levels and a thrifty vegetation of shallow-water plants. The plant growth usually will be automatic if water is maintained and marsh borders are not pastured. Digging and foraging by these animals help to keep a marsh from closing in solidly to vegetation; and trapping is one means of regulating the rat population to preserve a good balance between open water and thick stands of sedges, rushes, cattails, and other plants.

The fencing of marshes and streams ordinarily will pay in increased fur yields. Trampling animals destroy food and bank dens, and marsh vegetation usually is of poor quality for stock. Low fields that have been sown to reed canary grass may be attractive to feeding muskrats if nearby areas are sufficiently wet.

Particularly in glaciated territory it is common to find small swales with an area of open water in the center, a rim of cattails, and a surrounding belt of lowland brush. A good way to manage these in pastures is to run a fence outside the brush border and, if the water supply is sufficient, to blast or dig a basin to which stock can have access at one point. Grazing animals will make an unsightly mudhole of such a swale if it is not fenced, but if properly protected it will form excellent cover for such species as ducks, muskrats, pheasants, and rabbits. Multiflora rose will make an ideal fence for this purpose if the site around the swale is sufficiently dry.



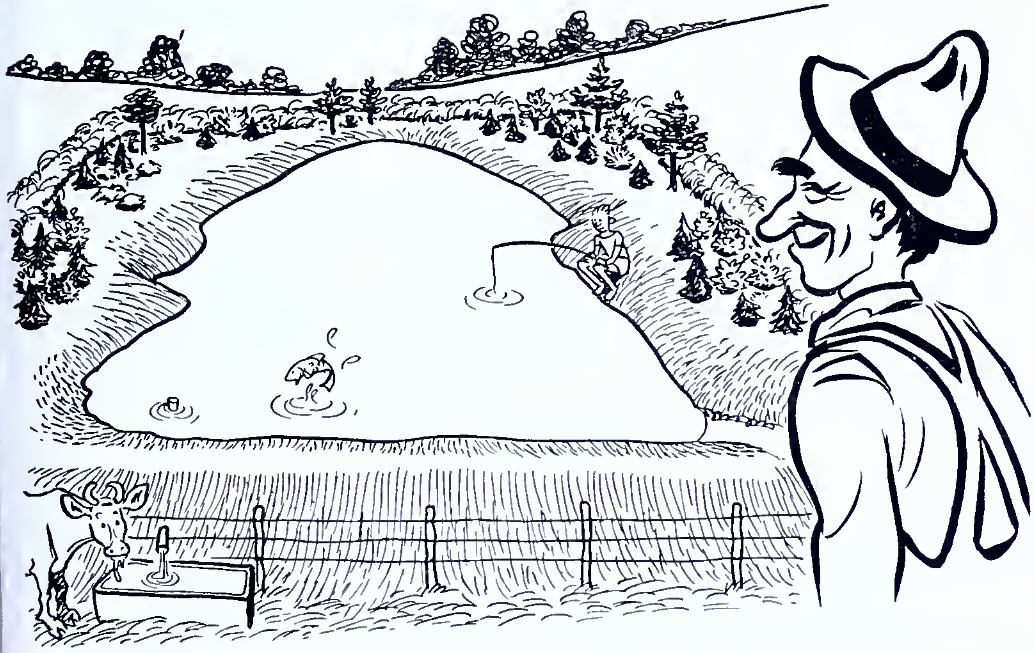
Swales of the type referred to sometimes dry up enough in summer for a heavy growth of smartweed, tearthumb, and similar plants to set a crop of seed. In this case the marsh will be of limited use for ducks and muskrats, but it will be a natural food patch for upland birds throughout the winter—with perfect cover all around. These combinations sometimes are made to order and need only be recognized and given some protection to obtain their best effects.

Marsh vegetation is particularly inflammable, and on farm lands of eastern United States it should under all ordinary conditions be protected from fire. Marsh fires frequently get beyond control and often spread to woodlots, fencerows, and even buildings.

The widespread habit of spring burning is destructive to the nests of ducks, rails, gallinules, coots, cranes, and numerous songbirds. Even when burning is done before the birds have nested, the thick dry vegetation upon which they depend for concealment is destroyed, and the area is reducd in usefulness for the current season. The discouraging of burning of all kinds of vegetation is one of the least costly and most constructive of management measures for farm-land wildlife.

The banks of streams under nearly all conditions should be protected with vegetation. Usually it is good practice to maintain them in a wooded condition and to cut timber and firewood as the trees mature. Steep bare banks are likely to wash and start gullies which will grow back into fields and pastures. Silting reduces the value of streams for drainage, as well as fish and other wildlife. A heavy cover of woody plants prevents spring flood waters from undercutting banks and destroying valuable land.

It is well to run pasture fences parallel with the stream but some distance from it, allowing the intervening strip to become woodland. At some strategic point where there is no danger of gullying, animals may be given access to the stream or a back water for watering purposes.



Managed Fish Ponds

Farm fish ponds are gaining widespread popularity, and many thousands of these impoundments of all sizes have been built during the past few years. Methods were developed in Alabama for increasing fish production in ponds by the use of commercial fertilizer. It now is possible for a southern farmer to raise 250 pounds of fish per acre of water in a year. This is comparable to the production of livestock on an acre of good upland. Although yields may be somewhat lower in the North, owing to the shorter growing season, the pond movement is gaining rapidly in that region.

Ponds are useful not only for fish production but for stock water and domestic ducks and geese. Some farmers have made their ponds small waterfowl sanctuaries where wild birds are decoyed by tame ducks and fed during the fall migration.

Fish ponds are kept free of leafy vegetation by deepening the marginal areas. Food for young fish is furnished by the minute free-living plants and animals that multiply abundantly in fertilized water. These pond areas usually are fenced against grazing to prevent silting. The immediate margin of the water customarily is kept clear to make fishing easier and to keep the impoundment from collecting leaves and brush. However, plantings of conifers and shrubs may be used on the watershed or inside the fence of the pond area itself. Muskrats must be excluded from fish ponds as there is no food for them and they would be a threat to dikes and dams.

Fish ponds should not be stocked indiscriminately with many kinds of fish. Some of the highest yields have been obtained by stocking new ponds with 100 largemouth black bass and 1,000 to 1,500 bluegill fingerlings per surface acre.

The proper building and operating of a pond requires professional guidance. In most areas this can be furnished by the Soil Conservation Service. In some states the State Conservation Department also provides assistance. Bulletins on the subject can be obtained from the Superintendent of Documents, the U. S. Department of Agriculture, and the U. S. Fish and Wildlife Service, all of Washington, D. C.[1]

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[1] Also see "Fish ponds for the farm," by Frank C. Edminster, Charles Scribner's Sons, New York, 1947.

GRRR
WATCH OUT FOR SPLINTERS, BIG BOY.

Chapter V

NUISANCE ANIMALS AND CROP DAMAGE

It was stated previously that certain rodents are the most destructive animals on the farm. Meadow mice and barn rats are particularly important in this respect.

Since small plant-eating animals of this type form the basic food supply for hawks, owls, weasels, foxes, etc., that usually is considered to be one justification for protecting the meat-eaters. Farmers frequently do not take well to this idea for several reasons. Much of the damage done by rodents is difficult to measure. Indeed, it may not be evident at all unless you know how to look for it. Secondly, the rodents may not be "controlled" effectively even when predatory species are plentiful. In addition, a fox, weasel, or great horned owl may damage the farmer's property in a way that is evident and easy to evaluate. This seems to be something of an economic tangle, but it probably can be straightened out by a little logical thinking.

At the maximum rate of increase and with no mortality, a meadow mouse could have more than a million descendants in one year. They are small, but in numbers they are mighty. That is why they are a constant threat to crop production. That also is why the "predators" do not wipe them out. But it is clear that something is killing off such animals in vast numbers, or they would overrun the earth.

The flesh-eaters are one factor. Others are disease, weather extremes, and food limitations. There may be more that we know nothing about. We will need to credit the carnivores with helping to prevent rodents from destroying the earth's vegetation and everything else with it. But we should not attribute the whole job to them, even though they are of undoubted importance.

It is not difficult to understand a farmer's feeling when he lets out his young chickens some morning and finds 20 of them dead. Doubtless he thought they were well housed, but all the weasel needed was a knothole. There may be half a dozen more weasels in the fields running about through mouse tunnels killing off the farmer's crop enemies. But we would not expect him to think of that.

The situation reduces itself to something like this: Most predatory birds and mammals do a year-round job of benefit to agriculture; but *individual animals* sometimes discover an easy food supply in the poultry yard. These need to be eliminated — quickly. The wise farmer will learn to take effective measures as soon as an animal with bad habits is discovered. But as a usual thing he will not bother the carnivores living on his land as long as they do not bother him.

Trouble in the Poultry Yard

One of the commonest situations that confronts the average farmer is the pilfering of young chickens either before or after they are turned into open range in the spring. The deed may be done at dusk, early morning, or in the full light

The small owls are almost universally beneficial. The farmer will do well to protect them.

of day. If coops are not closed and all openings covered with wire, large losses may occur in a single night.

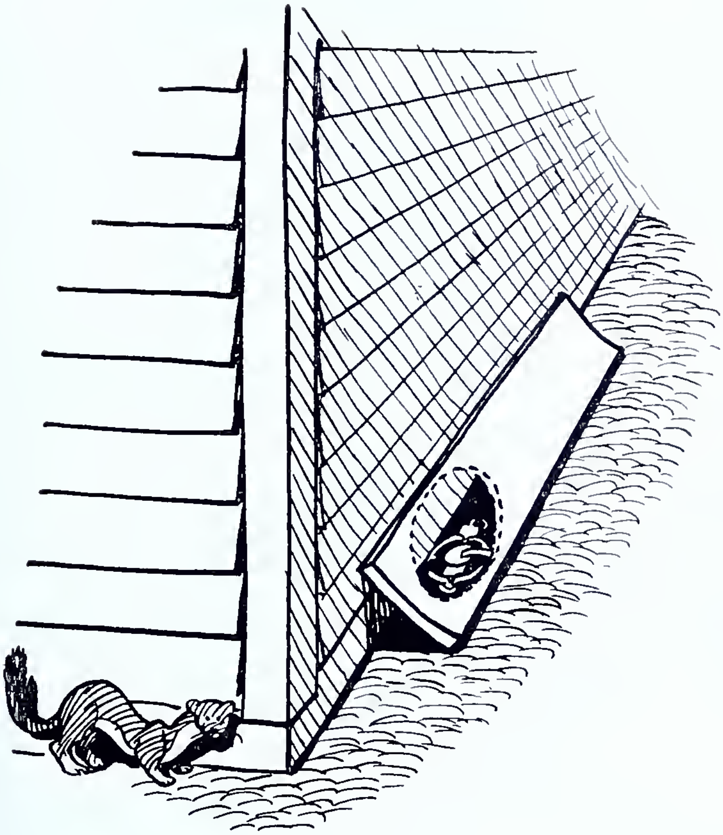
The most frequent poultry vandals are weasels, rats, crows, cats, skunks, raccoons, minks, opossums, hawks, and great horned owls. In one township in Washtenaw County, Michigan, weasels were found to have killed 1.03 percent of all chickens raised in a year. They accounted for more than half the poultry damage caused by all forms of wildlife. The worst depredations by rats occur when chicks are small and the animals can get under their wire runs. Minks, opossums, raccoons, and house cats may enter the coop and kill grown chickens on the roost. A skunk sometimes is the culprit when broilers are running in thick cover. Hawks and owls similarly help themselves when birds are in range fields. The small fast-flying bird-eating hawks are prone to cause more trouble than others, but that is somewhat beside the point. The hawk for a farmer to get is the one that eats his chickens.

A common characteristic of chicken-killers is that they return to feed on the victim. In a high percentage of cases a couple of steel traps set beside the carcass of a dead chicken will get the bird or animal that killed it. This is an ideal method. It catches the creature that did the damage without indiscriminate killing of beneficial animals.

A standard protection against weasels and rats often prevents trouble before the damage is done. Set two steel traps beneath a 6-foot, 2 by 10 plank which is laid along the foundation of a building and tilted edgewise against it. The dark runway thus created is irresistible to a rat or weasel and nearly always will be used in preference to traveling in the open.

A box trap constructed of inch-mesh poultry wire or hardware cloth frequently

The red-shouldered hawk seldom gets into tro
and feeds regularly on the farmer's crop ene
The best "predator control" policy is to kil
dividual animals that do damage rather than
to distinguish between "good or bad" spec



catches a chicken thief when baited with the dead bird. Control measures practiced on the farm should, of course, conform to state regulations.

By writing to the U. S. Fish and Wildlife Service or the Superintendent of Documents, Washington, D. C., a farmer always can get the latest bulletins on the control of destructive animals. Advice and assistance on specific problems usually are available both from the federal service and from state conservation departments. Local conservation officers frequently give valuable aid on such matters.

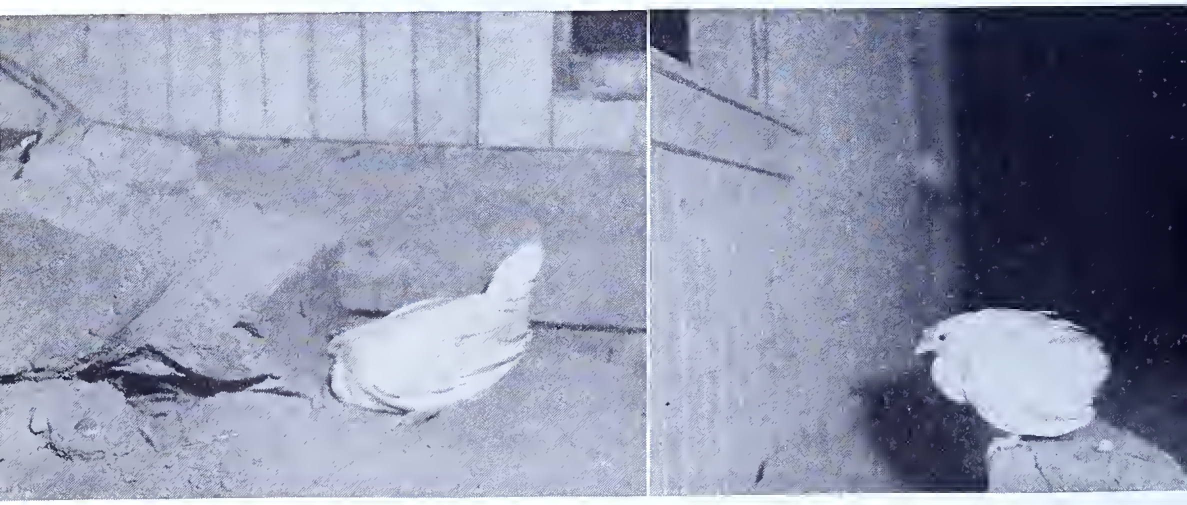
The Case of the Misunderstood Skunks

Sometimes crop and poultry damage is not so bad as it seems at first sight. A case from Michigan is an excellent example of how a situation may be interpreted wrongly:

A large poultry plant had several thousand young chickens running in alfalfa ranges. Skunks were common in the vicinity, and occasionally they were seen in the ranges at dusk or after nightfall. The remains of dead chickens were found each morning around the brooder coops — always cleanly picked.

It appeared evident that the skunks were killing chickens. Investigations after nightfall with a flashlight surprised entire families of these animals feeding upon dead birds near the coops. Continued study, however, showed that this was not just another case of poultry damage.

It was true that just at dusk an occasional healthy chicken was caught in



The sick chickens did not enter the brooder houses at night. They roosted on the grou
or on low blocks of wood. There they were found, and eliminated, by scavenging skunk

the thick alfalfa before it entered the brooder. But this amounted to only a small loss. The key to the situation lay in the fact that a considerable number of the poults in this large flock were affected with coccidiosis. These individuals grew thin and weak and finally did not enter the brooders at night. Instead, they roosted in the open wherever they happened to be. Nightly the skunks made the rounds and eliminated these ailing chickens that probably were only a few hours from death anyway. If the truth were known, the skunks may have been more of a benefit than a liability to this poultry plant.

This example is not meant to minimize or disclaim losses where they occur, but to illustrate the facts that may be learned by being open-mindedly inquisitive.

Vandals in the Corn

It is true that it is easy to overestimate evident damage. Muskrats are fond of the stalks of growing corn, and along streams their cutting may be conspicuous in adjoining fields. Although losses can be of serious proportions, most of them are not. A study of such cases in Iowa indicated that it requires a great deal of corn cutting by muskrats to add up to a couple of bushels at the harvest. And one or two pelts usually will pay more than the board bill of the entire population.

The pulling of sprouted corn by pheasants and crows sometimes necessitates expensive replanting by farmers in areas where these birds are particularly nu-

Fox squirrels raid the cornfield and carry ears to a favorite perch.

merous. In such localities crow shooting at any time of year is to be recommended as a sport. Sometimes it is effective to strew a few bushels of ear corn around the edge of a field to decoy pheasants from planted rows. Repellents seem to be useful under certain conditions. Other times they do not work, and it is sure that a great deal more needs to be learned about this subject.

Green corn on the stalk is attractive to raccoons. In bottomlands where they are plentiful these animals sometimes completely destroy a patch of sweet corn in a few nights. In this situation probably the only way to protect the corn is to erect a 2-foot poultry-wire fence topped by a charged wire. The electric fence will discourage raccoons, but it is a troublesome expedient.

In late summer and fall cornfields also are happy hunting grounds for squirrels. Fox squirrels tear open many ears and carry others into the woods to be eaten on a favorite perch. Usually, however, this damage is not excessive, and the farmer can collect for it in squirrel potpies in the autumn. That is the best way to control the situation.

It is inevitable that wildlife damage problems will develop on farms. But it seems true that the most serious trouble arises when man brings about a drastic unbalance between the different species in a community of living things. This seldom will happen on a farm where wildlife management is a part of the land-use planning.

zzz
zzz
BRUSHPILES ARE HOME TO MANY KINDS OF WILDLIFE

Chapter VI

THE GAME AND FUR HARVEST

Contrary to the ideas of many people, properly regulated shooting is by no means detrimental to a game population. Does it sound ridiculous to say that hunting some species may even contribute to the production of next year's crop? Here are some examples:

In most years probably the most important bottleneck in the growing of a new generation of fox squirrels is the winter food supply. It is well known that these animals bury nuts in the ground during the fall and then dig them up again in winter when food is scarce. Nuts are located by smell, and individual

squirrels do not have exclusive property rights. They dig up *any* nut that can be found. The food that one squirrel uses in the bleak days of February may have been stored by another animal that was killed in the hunting season.

That is the crux of the matter. The killing of a hunting season crop of squirrels for the most part eliminates animals that would have died anyway from one cause or another through winter and spring. This leaves the food buried by all to sustain the remainder of the population— which breed and bear their young from January to April. There is more food, less competition for tree dens, and a better crop of young. At least, that is the way it appears to work.

Another illustration would be animals like the pheasant, in which only males are shot. It has not been proved experimentally, but the logic of the situation is about like this:

As food and cover decline in quantity and quality during the winter, there is competition among surviving birds for the best feeding and roosting sites. Th fewer birds there are, the more favorable are the chances for the individual t become securely situated. So, if a large part of the cocks are killed in the hunting season, it is likely that more hens will survive the winter in good condition This should mean higher breeding productivity than if the surplus cocks (no needed for breeding) lived to compete for life necessities during "lean" winte months.

We certainly are not recommending hunting because of its great benefits t the game population. The point of the above examples is merely to emphasiz that intelligent and regulated hunting is not a *destructive* practice. It is comparable to running a combine through a wheatfield. It does not reduce nex year's yield.

As a matter of fact, if man does not take the annual harvest of small gam and fur, Nature does it anyway. In any ordinary fall season there are far mor rabbits. quail, muskrats, and skunks on the land than are necessary to insure, b breeding, a population of the same size the following year. This excess population is the wildlife crop, and experience has shown that preserving the surplu will not pay dividends in greater production.

The capacity of the land to support a population of any species of wild creature is limited, just as it is for cattle, corn, and soybeans. There is a give amount of seed which will give a maximum crop. Beyond that point any additional seed, or breeders, is mere waste of something that could be used.

It has been demonstrated on sample areas that where only male pheasants are shot three-quarters of the cocks can be taken by the gun without decreasing the breeding-season production. In the case of the cottontail it is possible to shoot half the animals present in the fall without

reducing the year-to-year yield of the land for this species. The hunter may consider at least a third of the fox squirrel population to be his fair share, and probably a similar proportion of the quail.

It is not to be supposed that a farmer can count his game and then shoot a prearranged number. But it will be evident to him about how plentiful most game and fur animals are on his farm. If they are abundant, he frequently will see them or their signs. It is then that hunting or trapping will be most rewarded and a heavy crop should be harvested. Where animals of a given kind are scarce, the landowner will do well to see that few are taken.

In some situations overcropping is prevented almost automatically by the increased difficulty of getting game as its numbers are reduced. It is doubtful that cock pheasants can be overshot by any reasonable amount of hunting where good cover is present. However, there is much more chance that too many quail will be killed by heavy shooting — and a corresponding need for protective measures.

The creation of wildlife sanctuaries posted against hunting is a safety measure that is used widely for quail. It must not be expected, however, that the mere creation of a sanctuary will guarantee a high population of desirable wildlife. A sanctuary, as such, only offers protection from the gun during the shooting season. Where the gun is not an important limiting factor to a given species, the elimination of shooting should not be expected to result in an increase.

Scarcities of farm game often are due to factors other than hunting. Most frequently shortages result from the depreciation of range through deterioration of soil and its cover. Closing an area to hunting will not remedy this.

The answer is to create favorable wildlife conditions on the land. That is, of course, almost the entire theme of this bulletin.

The Trespass Problem

As any farmer knows, a law-abiding sportsman will drive into your yard come to the house, and ask for permission to hunt on your land. He will leav his car there and conduct himself as though he realizes fully that he is your guest

On the other hand, any farmer knows that there is a hoodlum minorit among hunters who care nothing for property rights. They may come in from any direction without permission. Sometimes they cut fences to let dogs through drive onto a new seeding, kill stock, and shoot the farmer's signs. The true sportsman is aware of this situation and is eager to do what he can to eliminate th evil. But a few unfortunate experiences are likely to prejudice a farmer agains all hunters and cause him to close his land permanently to the harvesting of th game crop. It also will discourage him from doing anything to increase wildlife — to his own disadvantage.

Posting a farm may serve to keep out only the best type of hunter. Sign often mean nothing to the habitual trespasser. In the neighborhood of larg cities trespass is a continuing nuisance that many farmers would give much t be able to control. No one has ever really solved this problem, except locally b efficient organization of whole blocks of farms, and by rigid and expensive la enforcement. Fortunately, we now can suggest a way in which nearly an farmer can partially or completely handle this problem for himself:

The living fence of multiflora rose (p. 74) has been mentioned sever times. Such a fence will not only keep stock within a pasture, but it will kee hunters and their dogs outside a farm. The answer to trespass for many a farme will be to enclose his farm completely with multiflora. Where boundary fenc are old and need repair, the shrubs can be planted next to the wire. They wi grow through and over it, making an impenetrable tangle. The fencing proble is solved, with practically no maintenance, from then on. By agreement, tw farmers can share the cost of planting and put the fence directly on the line.

It may even be possible for a group of farmers to cooperate with intereste sportsmen in installing such fences. Clubs, especially, are always in search ways to "do something" for wildlife, and they could use their management mone by purchasing plants and helping to set living fences. This probably is one the best ways to increase rabbits, and such a fence offers cover to other desirab wildlife.

On some farms there will be marsh areas or woodlot borders where it will impossible to have an unbroken living fence. This idea will not work in all situ tions, but even an incomplete fence might help matters enough to make it wort while.

Chapter VII

WHAT ABOUT MY FARM?

Many ideas and general principles have been discussed in the foregoing pages. The person who is interested and wants to improve conditions for wildlife on a piece of land may be wondering "Where do I start? How do I apply all this to my farm?"

We may never get to see you or show you directly what can be done. But we can help you to help yourself. Conservation-minded people are all too few in this country of ours, and we want to include you in the rapidly growing host of folks who are practicing wildlife management.

Perhaps you are a progressive farmer with an ambition to improve your land and your business. Or you may live in the city and still have an interest in the old homestead. Even more likely: Are you a 4-H Club member or a Future Farmer of America? Do you want a specific project? We will describe some and you can choose what suits you best.

To begin with, you will want to take stock of what is on your farm already. Stand off and look at it. Is it rolling land? Are there erosion scars anywhere?

Or is it flat and clean right up to the fences? Has the woodlot been used for pasture? Are there ditches, streams, or a marsh? If so, are they muddy cattle wallows? Is there brush around them? Do they produce muskrats? Do any fences need replacing?

All of these things will determine what you should and can do. If a soil-conservation plan has been made for your farm, get out your aerial photo and use it in planning. Or make a sketch map of field boundaries, buildings, ditches, etc. It will help to visualize what the result should be.

Every farm has fencerows, so we will start with those.

Fencerow Project

Fencerows offer an excellent opportunity to provide more woody cover. Perhaps it is there already. If you have an overgrown field boundary where sassafras, oak, cherry, or other trees are overtopping the smaller growth — there is the place to begin.

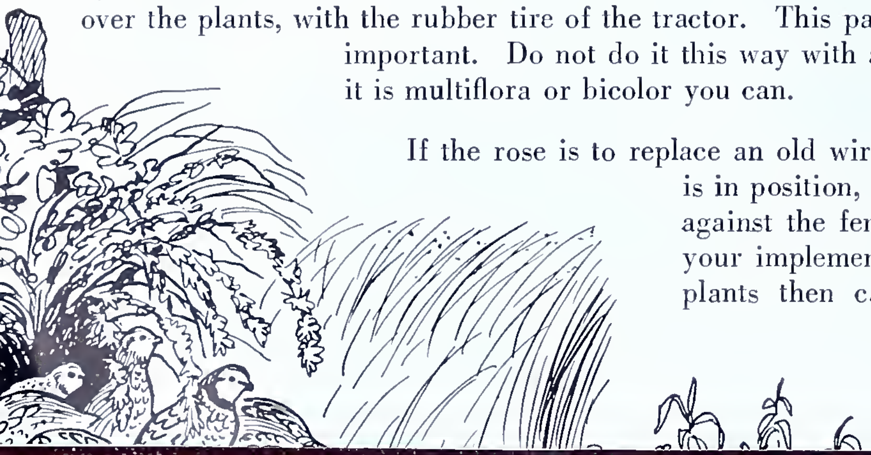
Cut out most of the trees and trim them for the woodpile. Pile the cut brush over boulders or stumps in the fencerow. Every few rods it is a good idea to leave a walnut, hickory, or white oak for the production of nuts — and for shade, in case there is a pasture across the fence. This is a "release" cutting. With more sunlight the small shrubs will thicken rapidly and increase ground cover.

More than likely your farm has clean fencerows and needs to have more shrub growth established. In and around pastures and permanent field boundaries you have a fine opportunity to do something that will count for wildlife and add to the beauty of your farm. Put in a fence of multiflora rose. This shrub is adaptable to a wide range of conditions and does not spread objectionably. You can count on the mature fence occupying a strip 8 to 10 feet wide.

For quick results get enough seedlings for a plant every foot in a single line. Where to get seedlings? You should arrange that through the nearest Soil Conservation District, the State Conservation Department, or your County Agent. Request planting specifications for the stock ordered. Early spring or late fall is planting time.

Multiflora is a tolerant shrub, and it can be planted by "production" methods. Turn a furrow with your double- or single-bottom plow. Then set your plants in position against the slice at the right height so the roots can be covered by another furrow the second time around. Now run down the row, directly over the plants, with the rubber tire of the tractor. This packs the earth and is important. Do not do it this way with all shrubs, but when it is multiflora or bicolor you can.

If the rose is to replace an old wire fence that already is in position, turn the first furrow against the fence as close to it as your implement will operate. The plants then can be laid, a foot



apart, against this furrow and covered by another. In this case, again, the tractor will be operated twice in the same direction and the packing can be done on the second trip back.

Multiflora plants may be set by hand if you wish. In this case you can put them directly under an old fence by scalping off a patch of sod with a shovel and then setting the shrubs in a vertical slit and packing the earth. In all cases the shrub roots should be kept moist while the work is being done.

After planting shrubs of nearly any kind the best care you can give them is mulching. Nearly any plant material will serve — straw, manure, hay, or weeds. This will hold moisture and keep down weed competition. On a good site multiflora usually will grow and become established with no care at all. However, the plants can be pushed along by mulching or cultivating. Corn fertilizer will hurry their growth also, but this stimulates weeds and cultivation becomes particularly necessary.

In 3 to 5 years your fence will be cattleproof. Eventually it should be hogproof — if the hogs are ringed. You can put multiflora inside the old pasture fence if you wish, as cattle usually do not damage it. This rose is ideal to fence off small waterholes, rock outcrops, or gullies in pastures. Protect them from grazing and such areas will be permanently useful to wildlife.

Brushpile Project

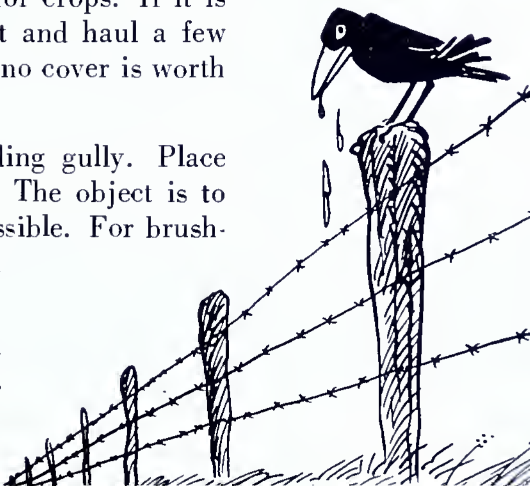
If your farm needs more cover, brushpiles are a means of getting it quickly in the locations where it will be most useful. How to go about it depends upon the time of year and other work that is being done.

There will be the most time for such things in winter. Are you cutting timber or firewood or making improvement cuttings in the woodlot? Near the edge is the best place for brushpiles. Make them 6 feet high and 15 feet across. If a dog can burrow through them or a hunter kick them over they are too small. Crisscross a few large limbs for a foundation, or pile them over a stump. That will keep the cuttings from rotting down quickly. Then lay on the slash generously. Put some heavy pieces over the top if you have them. Otherwise a high wind may blow your brushpile apart.

Perhaps there is an unused fence corner, a retired shoulder in a field, a rock pile, gully, or other spot that is not to be used for crops. If it is near the woodlot, you can get out the stoneboat and haul a few loads of brush. A brushpile built where there is no cover is worth much more than one in a thicket.

Don't pile brush in the middle of an eroding gully. Place your heaps around the upper part of the wash. The object is to retard runoff and keep water out of the cut if possible. For brushpiles help to prevent erosion as well as furnish wildlife cover.

Next summer examine those piles of slash occasionally, particularly the ones in the open.



An ideal brushpile is made by piling cuttings over a pulled or blasted stump in some out-of-the-way spot.

Are woodchucks digging burrows under them? Are song or game birds using them? Piles of droppings where the birds have roosted are your evidence. The undigested seeds which they contain will sprout readily if the sod is not too heavy. In a year or two a thicket of berry bushes and vines will be started around the brush if soil conditions and sunlight are favorable.

You can aid this process by digging up a few sprouts of Virginia creeper, bittersweet, or wild grape and planting them in the edge of the brushpiles. As the cuttings rot down the vines will keep growing.

Another way to make a living brushpile is to cut down two or three of the thick, round haw trees that grow in old pastures. Place them around a gully or rock outcrop and plant your vines beneath them. Set a few posts and run two or three strands of barbed wire around the spot to keep the cattle out. In a few years each tree will be a thriving tangle of cover.

When a soil-conservation plan is put into effect there usually is a revision of

These vines came from seeds in the droppings of birds that perched on the brushpile. Now it is a living tangle that will be good cover for many years.

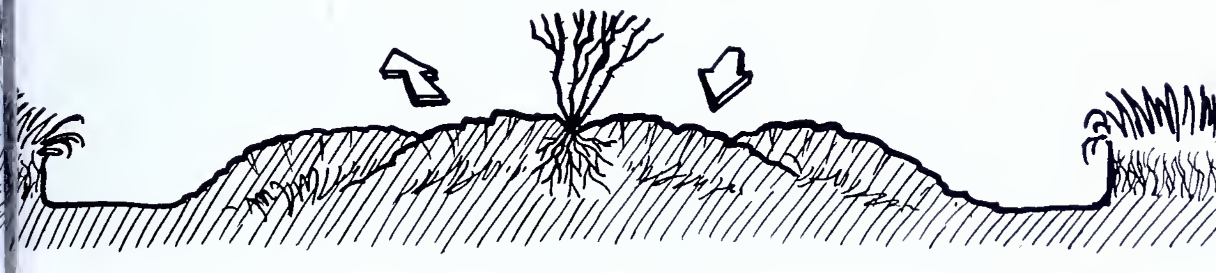
field boundaries. Frequently this means that an old fencerow or two need to be cleaned out and converted into cropland. The brush and pulled stumps from this operation are made to order for a brushpile project.

In a strip-cropping system there may be small triangular or odd-shaped correction plots between fields. These cannot be tilled efficiently and they are good places for the fencerow slash and stumps. Pile the stumps and heap the cuttings over them. The fresh earth exposed on the stumps is an ideal place for seeds to sprout, and soon you will have blackberries, raspberries, elderberry, nightshade, and similar plants appearing to thicken the covert and furnish wildlife food.

Planting a Hedge

Somewhere on your farm do you have a permanent unpastured boundary between two cropfields? If so, that is a good place for a hedge. Refer back to pages 49 and 55 for the reason why. Where a fence separates a pasture from cropland the hedge may be planted on the cropfield side of the fence. Better still, use multiflora rose and let it replace the old fence.

If your cultivated land is in strips, it will be easy to choose a site. Go about half way up the slope and select a contour boundary between two cropping units, or put the hedge between a cropfield and a permanent hay meadow. The upper edge of a hay filter strip above a diversion terrace or the backslope of a terrace are good locations also.



The hedge will be of greater value to wildlife if you can tie it into other cover at one or both ends — for example, the woodlot, a fence of multiflora rose, or another hedge.

If you use a single-row hedge, space the plants a foot apart. If a double row, then place the rows 2 feet apart and give the plants a 2-foot spacing. Stagger the rows so that a plant in one will come half way between two plants in the other. In that case two species of shrubs can be used if you wish.

In preparing the site for a hedge, a bed 4 to 8 furrows wide is plowed and packed or allowed to settle. It may be advisable to use a harrow or disk if a heavy turf has been turned. The plants can be set with a shovel or mattock. Bicolor or multiflora rose can be planted in a plow furrow as described for living fences.

Practically all shrubs will respond to the use of manure and superphosphate or a complete fertilizer. Fertilization is not a necessity, however, if the soil is good. A heavy mulching with straw will eliminate weed growth and the need for cultivating or mowing. Weed competition should be held down until the plants become well established.

There are many shrubs that will make good hedges if they are cared for properly and are placed in favorable sites. The Soil Conservation Service has tested dozens for their adaptability, rapid growth, and general usefulness. Following is a list of seven of the best ones. Wherever your farm and whatever your conditions, it is likely that at least one of these will be suited to your purpose.

Bicolor lespedeza (*Lespedeza bicolor*).—This is a good hedge plant for the southern general farming region and the cotton belt. It can be used as far north as southern Pennsylvania. The seed is a preferred quail food, and the plant provides both food and cover for rabbits. Bicolor succeeds well on nearly any site except wet or very acid soil. It is an excellent source of honey. In a few years improved heavy- and early-fruiting strains of bicolor or other bush lespedezas will be available for use farther north. If you use bicolor, the hedge probably should be at least two rows wide.

Highbush cranberry (*Viburnum trilobum*).—A handsome upright shrub suitable for use in the northern half of eastern United States. It will grow in either alkaline or acid soils of reasonable fertility in well-drained to wet situations. If your site is droughty or infertile, choose something else for the hedge.

Silky dogwood (*Cornus amomum*).—Another attractive species with red, green, and brown stems and bearing clusters of pale blue fruit. It occurs naturally in moist situations but thrives also on well-drained, but not dry, sites. It is adapted to nearly all of eastern United States.

Bayberry (*Myrica carolinensis*).—A small upright shrub best suited to the states east of Ohio and from Maine to Florida. It will grow on a wide variety of sites in acid soils. If the soil is alkaline, do not use bayberry.

Hybrid filbert and American hazelnut (*Corylus americana* × *avellana* and *C. americana*).—These two shrubs are used together to obtain cross-pollination. The hybrid form bears nuts nearly equal in quality to the commercial filbert. Good crops may be expected after the sixth year if the plants are on fertile soil. The nuts should be picked before they fall, or mice and other rodents will get the entire crop. These shrubs are adapted to nearly all of eastern United States. Do not use them on infertile or wet sites.

TATARIAN HONEYSUCKLE (*Lonicera tatarica*).—This is a bush honeysuckle from southern Russia and Turkestan. It will not escape and become a nuisance like the Japanese honeysuckle that is so plentiful in the South and East. Tatarian honeysuckle bears attractive pink and white flowers and red fruit. The shrub is shade-tolerant and grows well on all but the driest, wettest, or poorest soils. It may be used nearly anywhere in eastern United States.

MULTIFLORA ROSE (*Rosa multiflora*).—Since a hedge of this species is stock-proof, it is used most often as a living fence. It will grow in practically any situation that is not shaded or too wet and is used more than any other shrub for conservation plantings in the Northern States. It gives promise of being useful in the South, where it now is being tested. Multiflora grows 8 feet high and bears a profusion of white flowers in May and June. It forms excellent rabbit cover.

Field Border Project

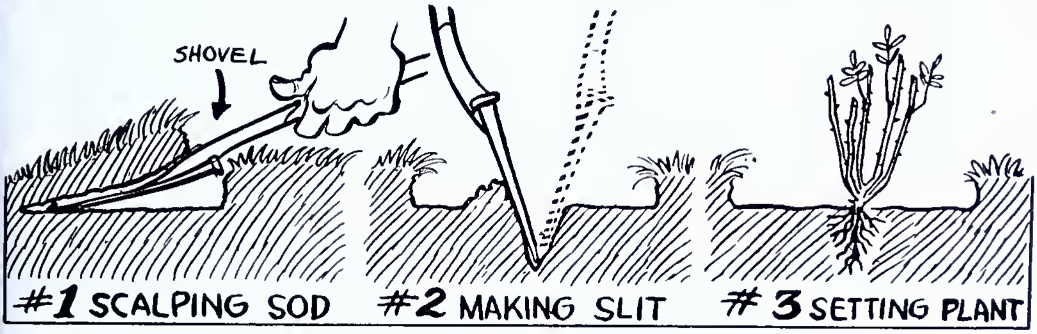
The place for a field border is in your cropland next to the woodlot. If there is more than one field bordering the woods, select for your project the one that needs it most.

The need for a border is not difficult to determine. Look down the edge of the field. Can you see the unproductive strip where tree roots extend into the cropland and sap moisture and fertility? How wide is this area? The taller the trees in the woodlot, the wider it will be. You have been working that field edge and applying fertilizer and seed to it every year. The chances are good that the crops it has grown have not paid for the seed. If the land is not level, you probably have erosion to deal with also.

We will establish a border here that will tie down the soil, help prevent shrubs from spreading into the field, and give you a turnrow and access road around the edge of the cropland. The border also can be cut for hay.

The kind of border to use depends upon the width of the sapped area. If it is only 20 to 30 feet, a strip of sericea lespedeza may be all that is necessary. Sericea is a deep-rooted perennial and will grow from Pennsylvania and southern Michigan southward. It will not seed in the North.

A sericea border should be sowed in March or April. In light soil the seedbed can be prepared with a disk. Where it is necessary to plow, start on the side



Cover can be increased in fencerows and odd spots by hacking into small trees and breaking them over. The tops continue to grow and sprouts bush out around the stumps.

next to the field and open a furrow, throwing the soil toward the field. Come back on the woods side of the strip, throwing the soil toward the woods. Continue breaking the land in this manner until you finish with the open, or dead, furrow in the middle of the strip. Then disk or drag to prepare for seeding. If the site is very poor, it will help to work some fertilizer and lime into the seedbed.

Where a field border runs down the slope, it may be advisable to plow a furrow every 20 feet or so across the border in such a manner as to lead surface water into the woods. Plow these after the bed has been fitted, and throw the soil of the cross-furrows down the slope.

Sericea lespedeza should be seeded at the rate of 15 pounds to the acre. Broadcast the seed, leaving it on top of the soil. It is advisable, especially on sloping sites, to follow with a light mulch of manure or straw. You should be able to see half the ground through the mulch.

Do not be discouraged if this border takes two or more years to become fully established. Once it comes in thick you can take off a cutting of hay early in the summer. If left uncut, sericea will be too coarse for hay.

The sapped area in a field next to a woodland usually is 40 or more feet in width. In this case your border should consist of a strip of shrubs next to the woods and sericea lespedeza on the field side.

The shrubs useful in a border are the same as those listed for a hedge. A four-row border is excellent, with the tallest shrubs against the woods. Species that would be good to use for the two rows on the field side are bayberry, multiflora rose, and shrub lespedeza. Bittersweet or coralberry also would be good for the number one row if a supply is available. For the two rows next to the woods hybrid filbert, Tatarian honeysuckle, silky cornel or highbush cranberry would be suitable. Be sure soil conditions are right for what you plant.

The seedlings should be spaced 4 feet by 4 in rows 1 and 2, and the taller shrubs in rows 3 and 4 may be spaced 6 by 6. They should be set in a well-prepared, preferably fertilized, seedbed. They should be mulched or cultivated for the first year, or until they have attained dominance over the weeds.

Your woodlot can be a project too. Fence it against grazing and mark den trees for preservation.

Where quail management is an important part of the wildlife plan, or where you have a poor site to work with, the shrub portion of the border can be entirely bicolor lespedeza. The quickest results will be obtained by setting four or five rows of plants 3 or 4 feet apart. They can be set in plow furrows, 2 feet apart in the row. The shrubs will need to be cultivated while small and, if fertilized, they should make seed the first year.

Bicolor also can be established by seeding. But this is more difficult, and advice should be obtained from the nearest Soil Conservation District before it is attempted. Your local conditions will determine what method is best. After the shrub part of your wildlife border has become well established, it should not require maintenance. The sericea portion will serve as your access road and turnrow, and it can be mowed like any other patch of perennial hay.

Other Suggested Projects

At least one of the measures we have discussed should be practical on nearly any farm. There are numerous other things you can do to improve wildlife living standards. But in most cases it is difficult to be specific. The jobs need to be fitted to your conditions.

For example, we recommend that you consider a fish pond. If your land is hilly, if it has any watersheds of 8 or 10 acres, get an expert from the state college or from the Soil Conservation Service to examine the area. He may find a

Nest boxes for squirrels are easily built of scrap materials.

suitable site. The U. S. Department of Agriculture has bulletins on the construction and management of fish ponds which will be furnished upon request. A decade ago there were no managed ponds on American farms. Today there are thousands of farm families who would not be without the fertilized acre of water that furnishes them endless pleasure and an important article of diet.

If there is a woodlot on your farm, that is an excellent possibility for a project. What you do depends largely upon where you live, what the local markets are, and what species of wildlife you are dealing with. In the open stands of longleaf or loblolly pine in the deep South food strips of bicolor lespedeza would be in order (p. 81). In the North one of your best projects would be to fence the woodlot against grazing and to mark den trees for preservation.

A practical short-time project would be the spot-planting of nut trees about your farm (p. 54). As pointed out elsewhere, the best locations are on rough land in the open where the trees get ample sunlight.

Do you have some sawmill slabs around, or rough lumber not useful for something else? If there is time and you are so inclined, you can build a few nest boxes for squirrels. These should be about a foot square and 2 feet high. They should have a 3-inch hole near the top next to the tree. A shape like the illustration is good. Nail kegs will work also. Place the boxes in the trees near your dooryard. You may not increase squirrels greatly, but you can bring them close to your home where they will be a source of pleasure to the family. Of course, the same idea applies to bird houses.

Managing roadside cover is another project that should hold some interest, and it might well bring about a vast improvement in the appearance of a property. Suggestions for this are given on page 53.

The possibilities in ditchbanks, marshes, and wet areas have been discussed also. Each might provide a good work unit in wildlife management that would fit into school or club conservation work. Each farm is different from every other. What is done obviously will reflect the interest and imagination of the doer.

It has become apparent in recent years that many of our old methods are becoming outmoded. New facts and new techniques are being developed steadily.

By the time this publication reaches print some of its details may be improved upon. We hope they are, for that means progress.

But one thing we have stressed is not going to change — the basis for practical wildlife management is good land management. Regardless of how little you know of the habits and requirements of wild animals, if you follow this idea you never will be far wrong. You can depend upon it.

* * *

Summing it up

Wildlife management on the farm consists principally in doing a good job of farming.

Basic to this, according to the modern idea, is a land-use plan that will assure the production by every acre of the most valuable crop to which it is adapted. "Adapted" implies continued production without loss of fertility.

As a matter of fact, land planners will not be satisfied unless that acre, in the course of usage, is built up in productivity and increased in value. This, they say, is true conservation — the enrichment of our capital stock — good business.

A well-planned farm is likely to yield a diversity of crops. The most fertile, most nearly level fields can support short rotations and show a high cash return. On poorer sites rotations must be longer, with more hay and less income. Hilly areas that would wash badly under tillage must be stabilized with grasses and legumes. These are the pastures. The roughest portions of the farm, and the "waste" areas, may be suited only to trees or clumps of wildlife cover. From each land unit something is received. No part of the farm fails in some capacity to pay its dividend.

Wildlife values on the farm are poorly expressed in terms of cash alone, although the fur crop ordinarily is a source of income. Game represents recreation and an occasional meal to the farmer — and to his friends if he chooses. A plentiful population of bird and animal life helps to maintain a check on insect and rodent pests that might otherwise get beyond control. And, for most rural residents, the presence of a living world of birds and other creatures about them helps make the farm a pleasant place to live.

In primitive times our typical farm wildlife, like the quail, cottontail, and fox squirrel, lived around forest openings or on the border between woodlands and the prairies. The breaking up of large stands of forest favored these animals, and they spread into the new farm-land type of range. Forest-dwelling species, like the gray squirrel and wild turkey, were reduced correspondingly by this change.

Farm wildlife is a product of "edge" conditions. It lives where crop and cover types are mixed together and where there is access to the benefits that each type furnishes. Planning a farm "on the contour," as the soil conservationist does, usually results in a land pattern where different kinds of vegetation are broken up into units of irregular shape with plenty of borderline. This is one reason why a complete soil conservation program also is good wildlife management. This applies mainly to hilly land, but modern soil-building and cropping practices on level land favor the increase of fertility, and in most instances this, too, will benefit wildlife.

There are many specific things that a farmer can do for wild birds and animals if he wishes. But the most important would be done anyway, purely for their agricultural value. The wise landowner will not graze his woodlots, marshes, and streambanks. He will refrain from burning fencerows, pastures, and lowlands. Such negative measures will help to assure a continuous yield of woodland products, conserve the fertility of the soil, preserve fence wire and posts, increase the fur and game crop, and encourage all useful wildlife.

The up-to-date farmer also will have a positive "action" program. In the proper places he will make use of legume field borders, contour hedges, and living fences; and he will permit the development of natural-brush cover and hedgerows. By such means he will reduce soil washing, promote the absorption of water by the land, create guide lines for cultivation, obtain windbreak benefits for growing crops, distribute insect- and rodent-eating birds and mammals through his fields, secure maintenance-free pasture fencing, and add much to the beauty and value of the farm. Measures of this kind are the best kind of wildlife management.

If he is interested sufficiently, there are other things a farmer can do — some of them a little at a time and as opportunity presents.

One of these is to fence off stone piles, ditchbanks, and rough areas where thickets can grow. The ideal way is to use living fences of multiflora rose. A few pines here and there on the farm add cover and improve appearances. Walnuts planted in fencerows help the squirrels. A shrub border along the woodlot will improve timber and attract birds. Den trees can be left to rot away in usefulness. Cutting operations leave brushpiles in woodlots, around gullies, and in odd corners. Perhaps something can be done to maintain water levels in marshes that dry out in summer.

On the well-managed farm many kinds of wildlife find their places in reasonable numbers. A liberal fur and game harvest and the living things on every side help to keep each species in proper balance with the rest of the community.

It is unlikely that all of these measures can apply to a single farm. But some of them will, and each improvement should help. It is fundamental for every purpose to build fertility — to make the land more productive.

Better soils yield more of all crops — including wildlife.

DON'T BURN IT UP— IT'S USEFUL!

PILED BRUSH HELPS CONTROL GULLIES— ATTRACTS SONGBIRDS, FUR, AND GAME.

- PILE CUTTINGS AROUND WASHES AND GULLIES

- SONGBIRD DROPPINGS SEED-IN SHRUBS AND VINES THAT HELP HOLD THE SOIL

- ROTTING OF THE BRUSH ADDS HUMUS

WILDLIFE BELIEVES IN MULTIPLE USE.

- WOODCHUCKS PREFER BRUSH HEAPS FOR DEN SITES

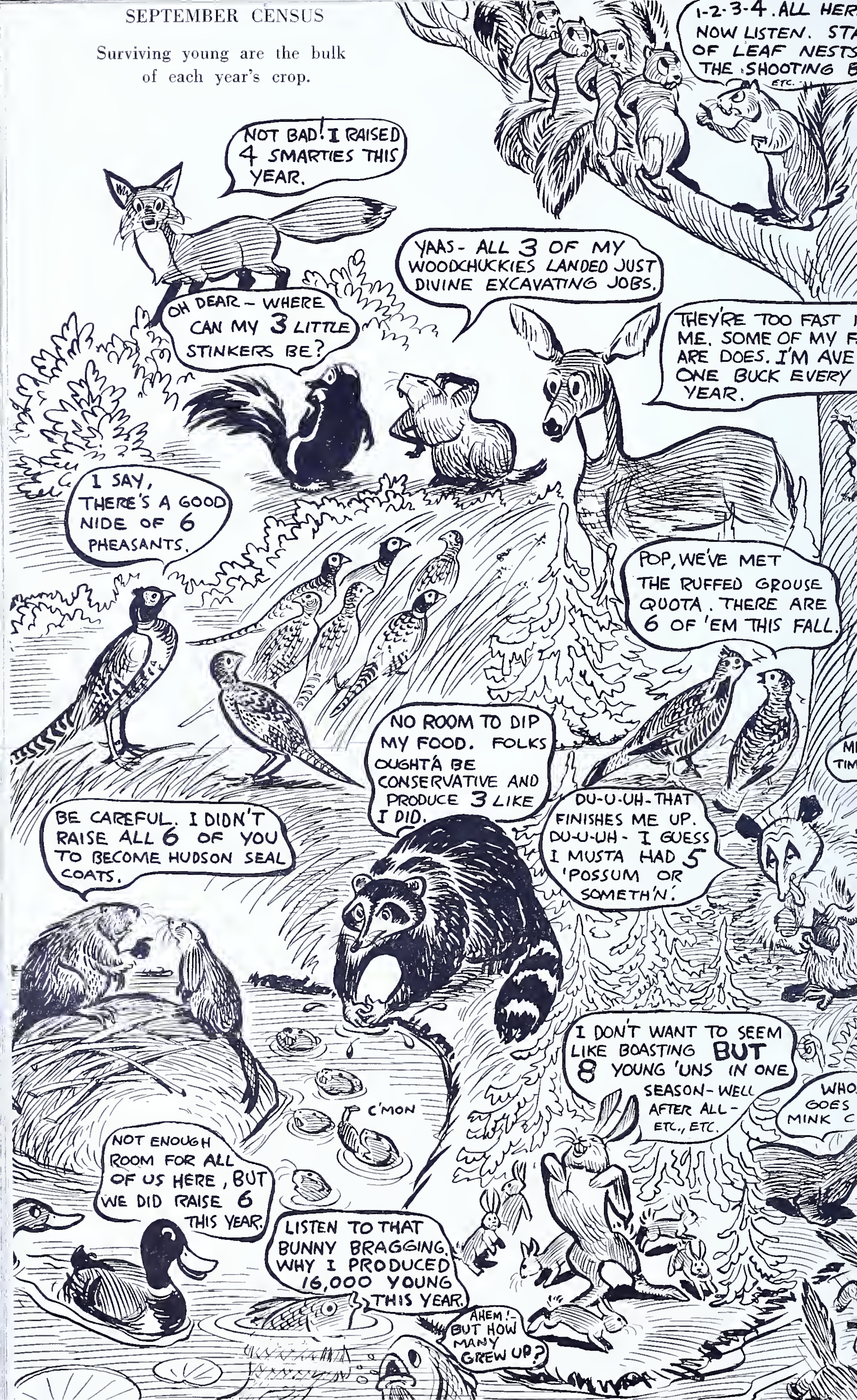
- SKUNKS "HOLE UP" IN WOODCHUCK DENS

- COTTONTAILS FIND BRUSH AND BURROWS IDEAL COVER

- PHEASANTS AND QUAIL FIND SHELTER IN THE NETWORK OF BRANCHES

SEPTEMBER CENSUS

Surviving young are the bulk of each year's crop.


1-2-3-4. ALL HER
NOW LISTEN. STA
OF LEAF NESTS
THE SHOOTING B
ETC.
NOT BAD! I RAISED 4 SMARTIES THIS YEAR.
YAAS- ALL 3 OF MY WOODCHUCKIES LANDED JUST DIVINE EXCAVATING JOBS.
OH DEAR – WHERE CAN MY 3 LITTLE STINKERS BE?
THEY'RE TOO FAST I
ME. SOME OF MY F
ARE DOES. I'M AVE
ONE BUCK EVERY
YEAR.
I SAY, THERE'S A GOOD NIDE OF 6 PHEASANTS.
POP, WE'VE MET THE RUFFED GROUSE QUOTA. THERE ARE 6 OF 'EM THIS FALL.
NO ROOM TO DIP MY FOOD. FOLKS OUGHT'A BE CONSERVATIVE AND PRODUCE 3 LIKE I DID.
MI
TIM
BE CAREFUL. I DIDN'T RAISE ALL 6 OF YOU TO BECOME HUDSON SEAL COATS.
DU-U-UH-THAT FINISHES ME UP. DU-U-UH - I GUESS I MUSTA HAD 5 'POSSUM OR SOMETH'N'.
I DON'T WANT TO SEEM LIKE BOASTING BUT 8 YOUNG 'UNS IN ONE SEASON- WELL AFTER ALL- ETC., ETC.
WHO
GOES
MINK C
C'MON
NOT ENOUGH ROOM FOR ALL OF US HERE, BUT WE DID RAISE 6 THIS YEAR.
LISTEN TO THAT BUNNY BRAGGING. WHY I PRODUCED 16,000 YOUNG THIS YEAR.
AHEM! - BUT HOW MANY GREW UP?

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MAY 1973
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